6 — BB Troubleshooting and Manual Tuning Guide

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Table of Contents

Introduction to baseband troubleshooting....6–5
Baseband main troubleshooting....6–6
General power checking troubleshooting....6–7
Battery current measuring fault troubleshooting....6–8
Flash programming fault troubleshooting....6–9
Keyboard troubleshooting....6–9
USB interface troubleshooting....6–11
Charging troubleshooting....6–12
Dead or jammed troubleshooting....6–13
IrDA troubleshooting....6–14
Vibra troubleshooting....6–15
MiniSD troubleshooting....6–16
SIM troubleshooting....6–17
Display module troubleshooting....6–18
- General instructions for display troubleshooting....6–18
- Display fault troubleshooting....6–20
- Display and keyboard backlight troubleshooting....6–21
- EL backlight fault troubleshooting....6–24
- ALS troubleshooting....6–25
- LED driver troubleshooting....6–28

Bluetooth troubleshooting....6–29
- Introduction to Bluetooth troubleshooting....6–29
- Bluetooth settings for Phoenix....6–29
- Bluetooth self tests in Phoenix....6–30
- Bluetooth BER failure troubleshooting....6–32
- BT audio failure troubleshooting....6–33

Audio troubleshooting....6–34
- Audio troubleshooting test instructions....6–34
- Internal earpiece troubleshooting....6–37
- Internal microphone troubleshooting....6–38
- IHF troubleshooting....6–39
- External microphone troubleshooting....6–40
- External earpiece troubleshooting....6–41
- Introduction to acoustics troubleshooting....6–42
- Earpiece troubleshooting....6–43
- Acoustics IHF troubleshooting....6–44
- Microphone troubleshooting....6–45

Baseband manual tuning guide....6–46
- Energy management calibration....6–46

List of Tables

Table 9 Display module troubleshooting cases....6–18
Table 10 Pixel defects....6–19
Table 11 Calibration value limits....6–46

List of Figures

Figure 34 Flashing pic 1. Take single trig measurement for the rise of the BSI signal....6–9
Figure 35 Flashing pic 2. Take single trig measurement for the rise of the BSI signal....6–9

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Figure 36 Ambient Light Sensor Calibration window....6–26
Figure 37 BER test result....6–30
Figure 38 Bluetooth self tests in Phoenix....6–31
Figure 39 Single-ended output waveform of the Ext_in_HP_out measurement when earpiece is connected....6–35
Figure 40 Differential output waveform of the Ext_in_IHF_out out loop measurement when speaker is connected....6–35
Figure 41 Single-ended output waveform of the HP_in_Ext_out loop when microphone is connected....6–36

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Introduction to baseband troubleshooting

This chapter outlines the troubleshooting process for any baseband related problems reported from our customer. All troubleshooting by service technicians will be limited to those parts that are not under any shields.

Basic Troubleshooting for RM-88

The most likely problems that may be reported with RM-88 engine are listed below.

- Phone does not power up or gets jammed during startup.
- Abnormal current consumption.
- Flashing does not work.
- Charging does not work.
- Display does not work.
- Keypad does not work.
- Display backlight does not work.
- Keyboard EL dome sheet does light up.
- Mail indicator LED does not work.
- Phone gives SIM card error.
- Phone cannot access SD card.
- USB does not work.
- Audio (earpiece, microphone, and/or IHF) does not work.
- Audio headset does not work.
- Volume key does not work.
- Bluetooth does not work.
- IRDA does not work.

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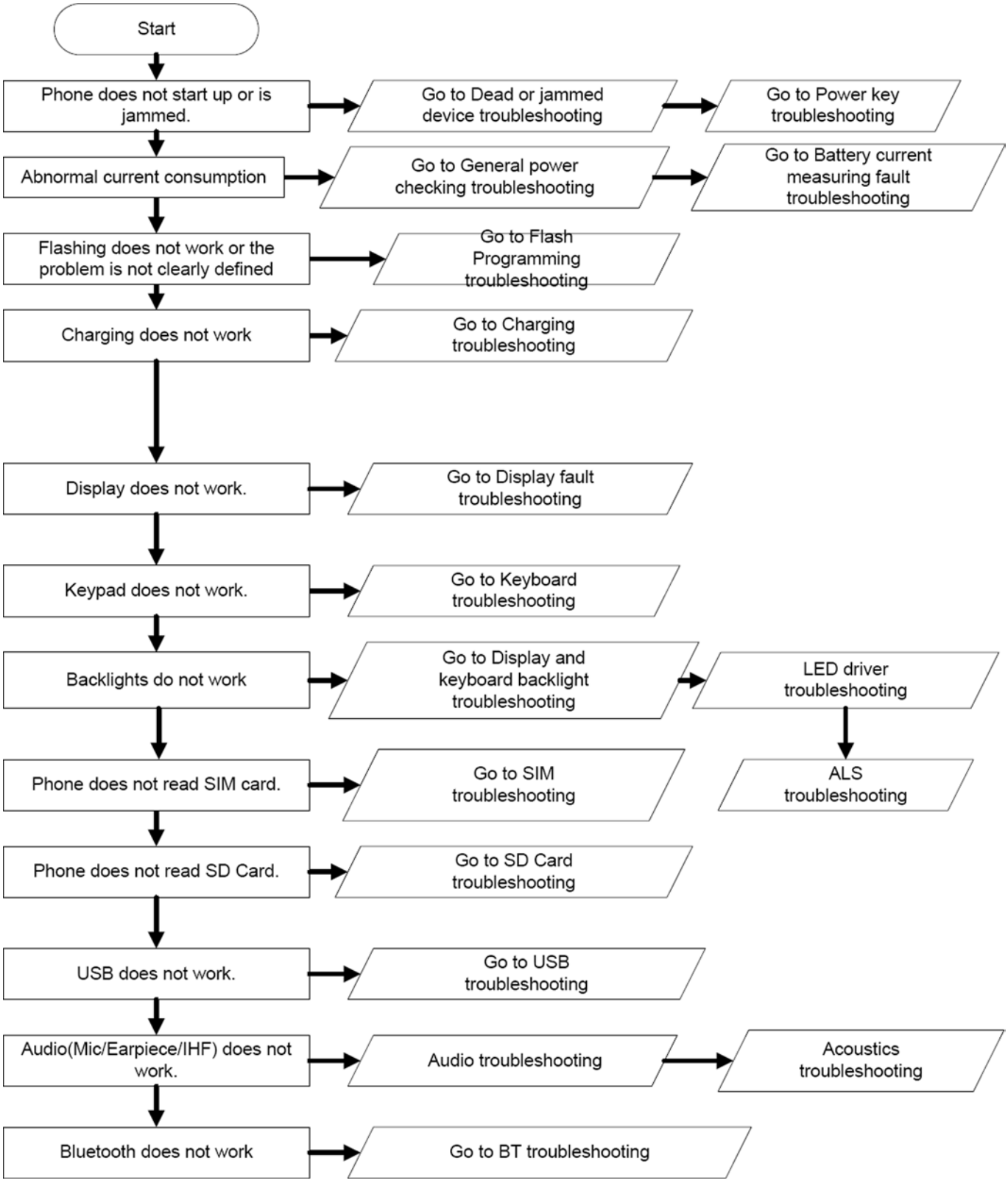
Baseband main troubleshooting

Troubleshooting flow


Start
Phone does not start up or is jammed.
Go to Dead or jammed device troubleshooting
Go to Power key troubleshooting
Abnormal current consumption
Go to General power checking troubleshooting
Go to Battery current measuring fault troubleshooting
Flashing does not work or the problem is not clearly defined
Go to Flash Programming troubleshooting
Charging does not work
Go to Charging troubleshooting
Display does not work.
Go to Display fault troubleshooting
Keypad does not work.
Go to Keyboard troubleshooting
Backlights do not work
Go to Display and keyboard backlight troubleshooting
LED driver troubleshooting
Phone does not read SIM card.
Go to SIM troubleshooting
ALS troubleshooting
Phone does not read SD Card.
Go to SD Card troubleshooting
USB does not work.
Go to USB troubleshooting
Audio(Mic/Earpiece/IHF) does not work.
Audio troubleshooting
Acoustics troubleshooting
Bluetooth does not work
Go to BT troubleshooting

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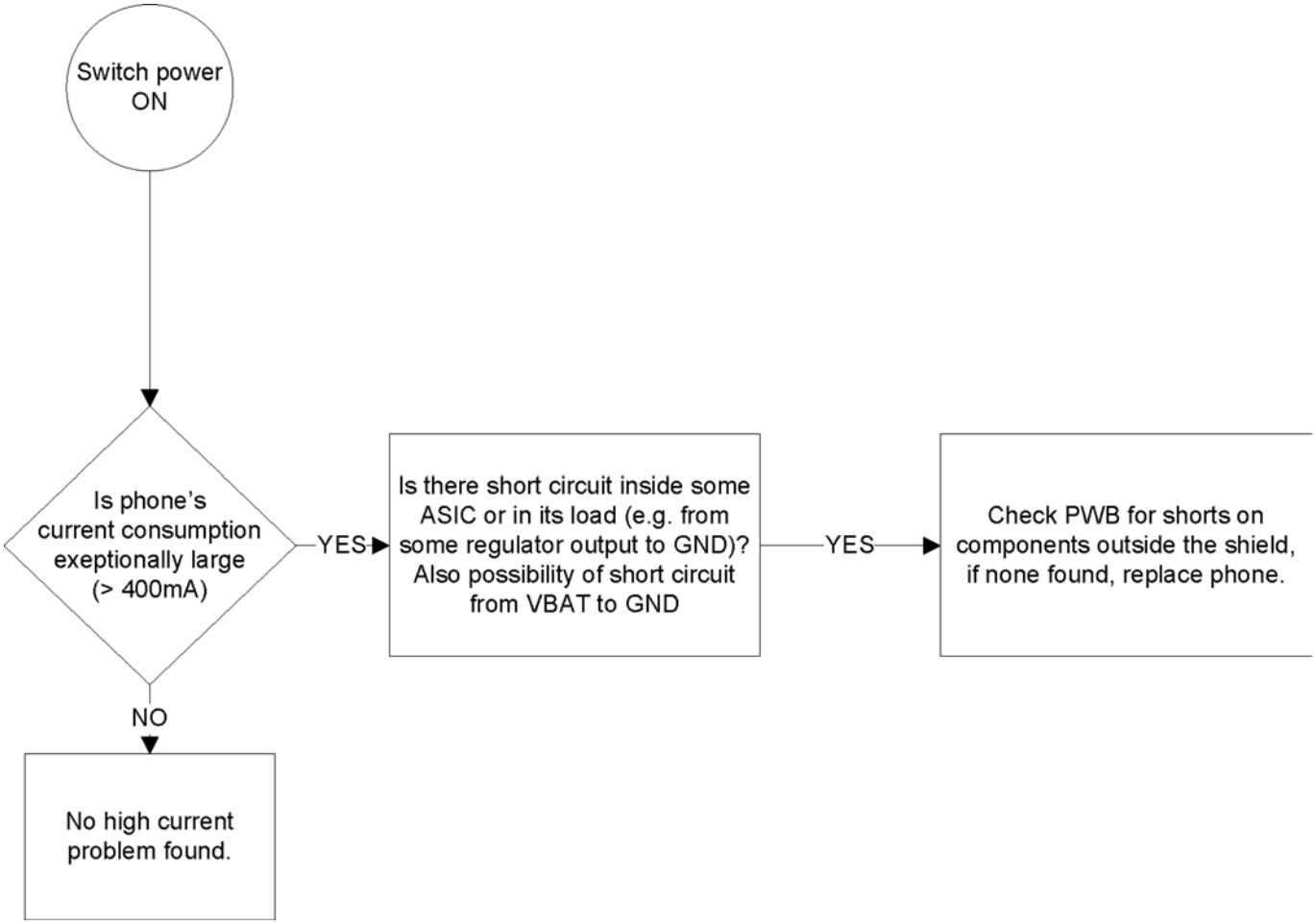
General power checking troubleshooting

Troubleshooting flow


Switch power ON
Is phone's current consumption exeptionally large (> 400mA)
YES
Is there short circuit inside some ASIC or in its load (e.g. from some regulator output to GND)? Also possibility of short circuit from VBAT to GND
YES
Check PWB for shorts on components outside the shield, if none found, replace phone.
NO
No high current problem found.

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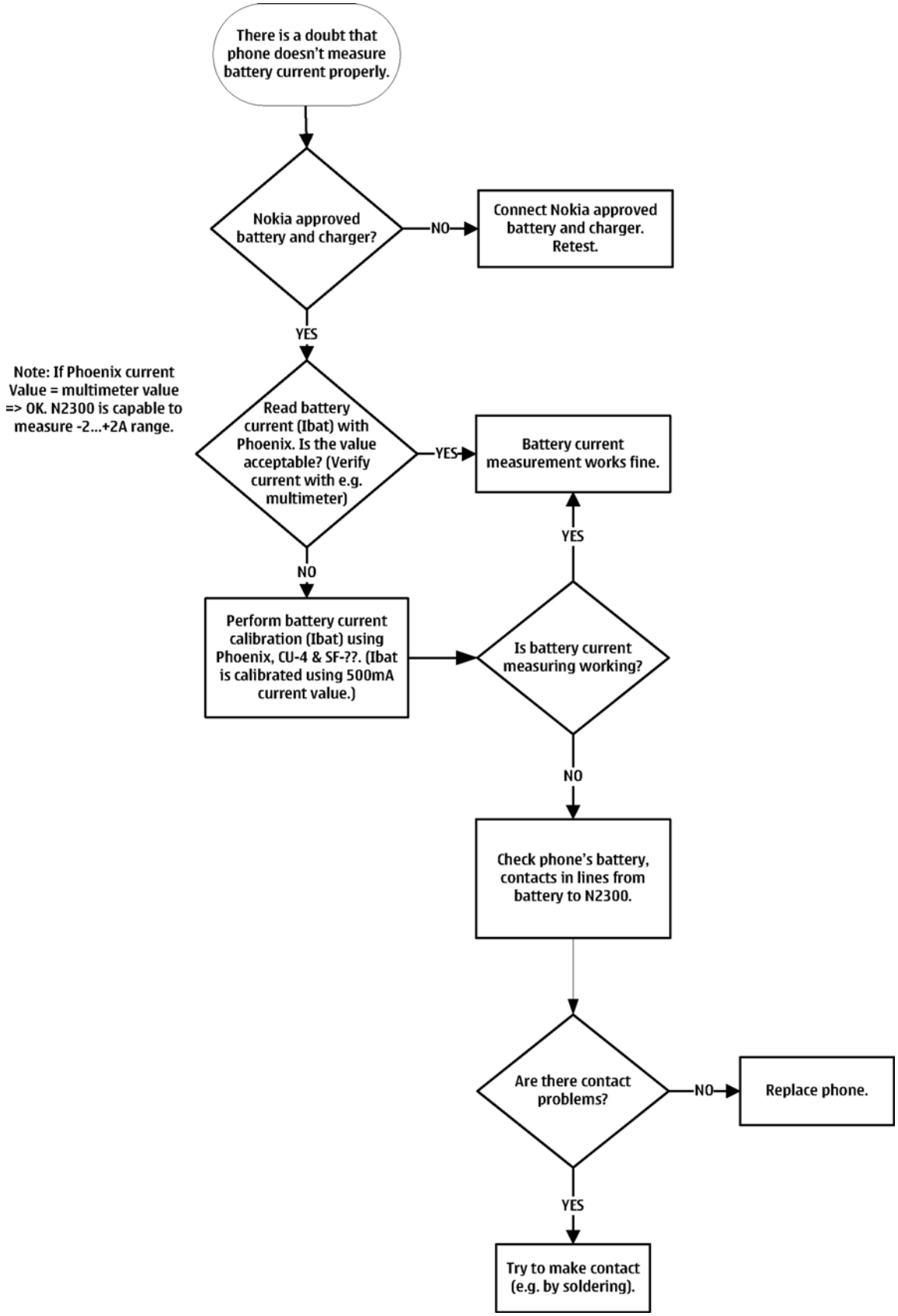
Battery current measuring fault troubleshooting

Troubleshooting flow


There is a doubt that phone doesn't measure battery current properly.
Nokia approved battery and charger?
NO
Connect Nokia approved battery and charger. Retest.
YES
Note: If Phoenix current Value = multimeter value => OK. N2300 is capable to measure -2...+2A range.
Read battery current (Ibat) with Phoenix. Is the value acceptable? (Verify current with e.g. multimeter)
YES
Battery current measurement works fine.
NO
YES
Perform battery current calibration (Ibat) using Phoenix, CU-4 & SF-??. (Ibat is calibrated using 500mA current value.)
Is battery current measuring working?
NO
Check phone's battery, contacts in lines from battery to N2300.
Are there contact problems?
NO
Replace phone.
YES
Try to make contact (e.g. by soldering).

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Flash programming fault troubleshooting

Troubleshooting flow

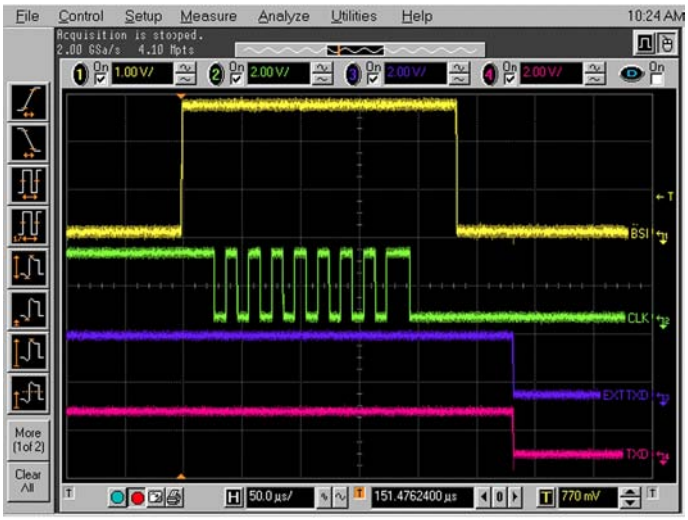

Figure 34 Flashing pic 1. Take single trig measurement for the rise of the BSI signal.

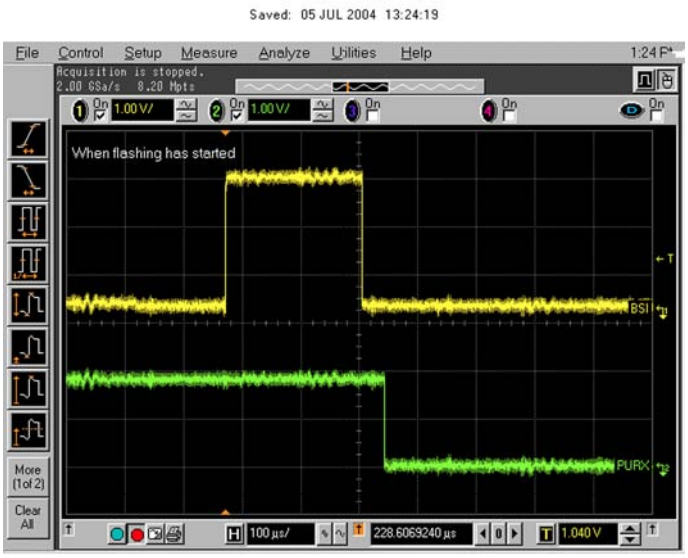

Figure 35 Flashing pic 2. Take single trig measurement for the rise of the BSI signal.

Keyboard troubleshooting

Context

There are two possible failure modes in the keyboard module:

- One or more keys can be stuck, so that the key does not react when a keydome is pressed. This kind of failure is caused by mechanical reasons (dirt, corrosion).

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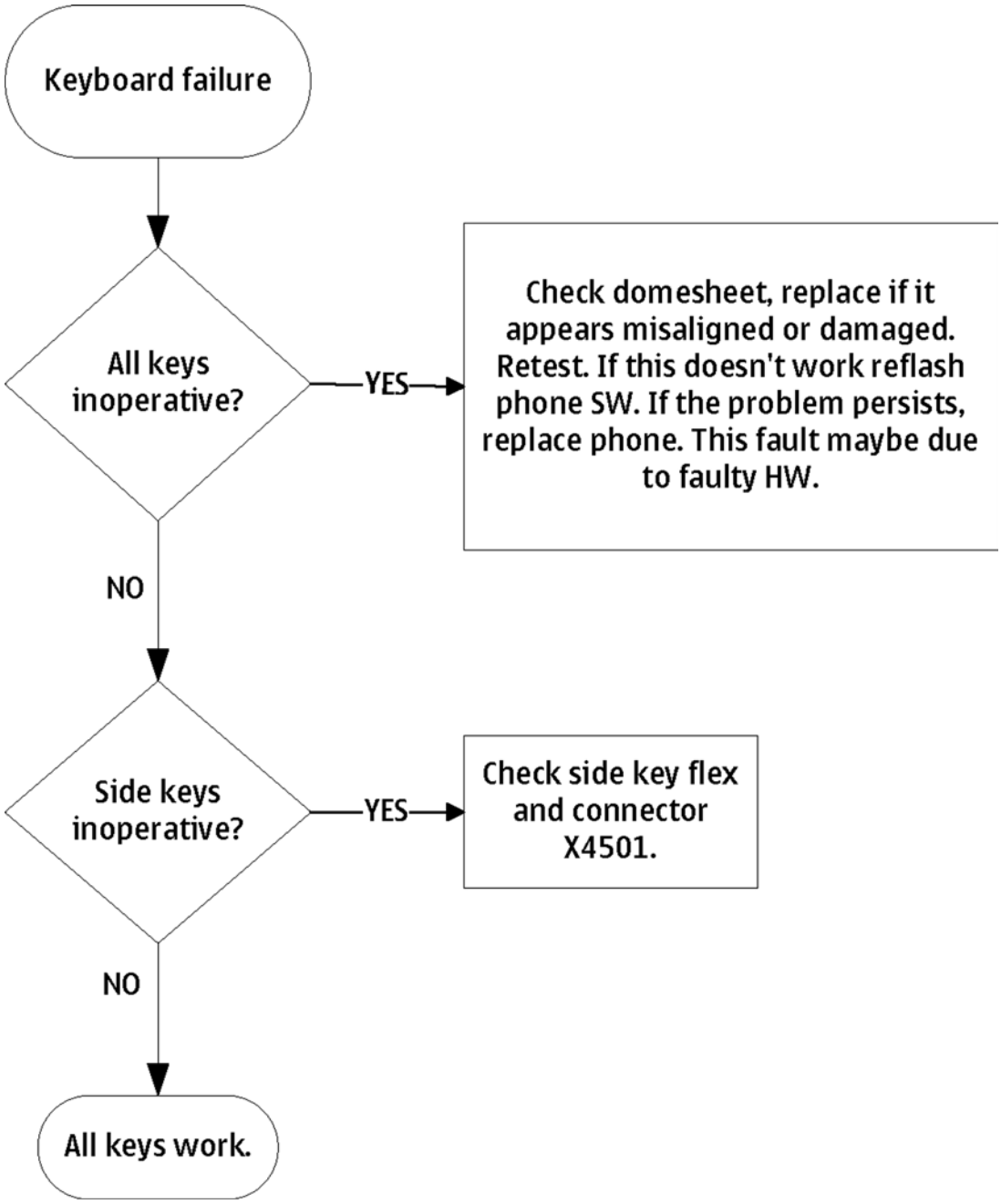
- Malfunction of several keys at the same time; this happens when one or more rows or columns are faulty (shortcut or open connection). For a more detailed description of the keyboard and keymatrix, see section **Keyboard** in **System Module**.

If the failure mode is not clear, start with the **Keyboard Test** in *Phoenix*.

Troubleshooting flow


Keyboard failure
All keys inoperative?
YES
Check domesheet, replace if it appears misaligned or damaged. Retest. If this doesn't work reflash phone SW. If the problem persists, replace phone. This fault maybe due to faulty HW.
NO
Side keys inoperative?
YES
Check side key flex and connector X4501.
NO
All keys work.

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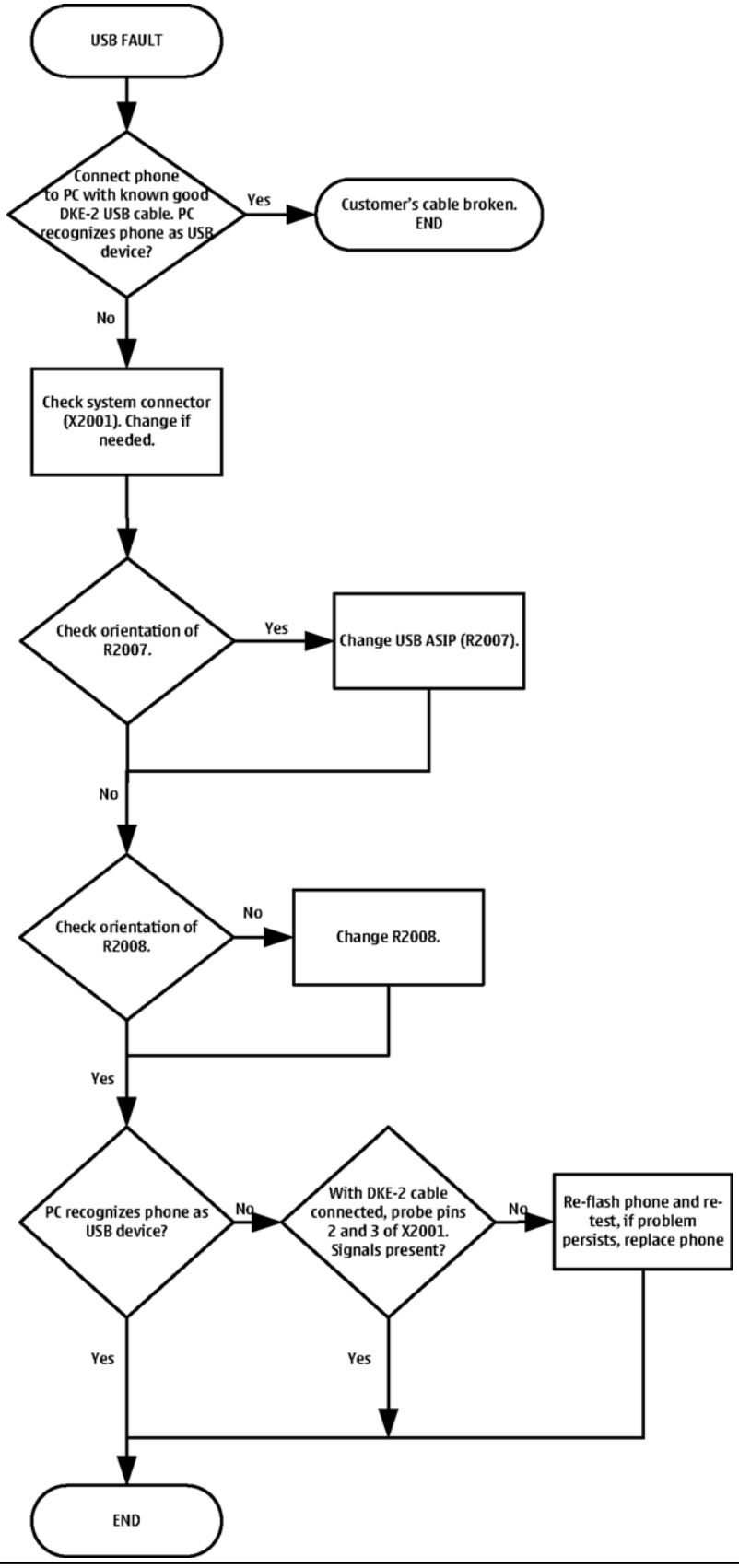
USB interface troubleshooting

Troubleshooting flow



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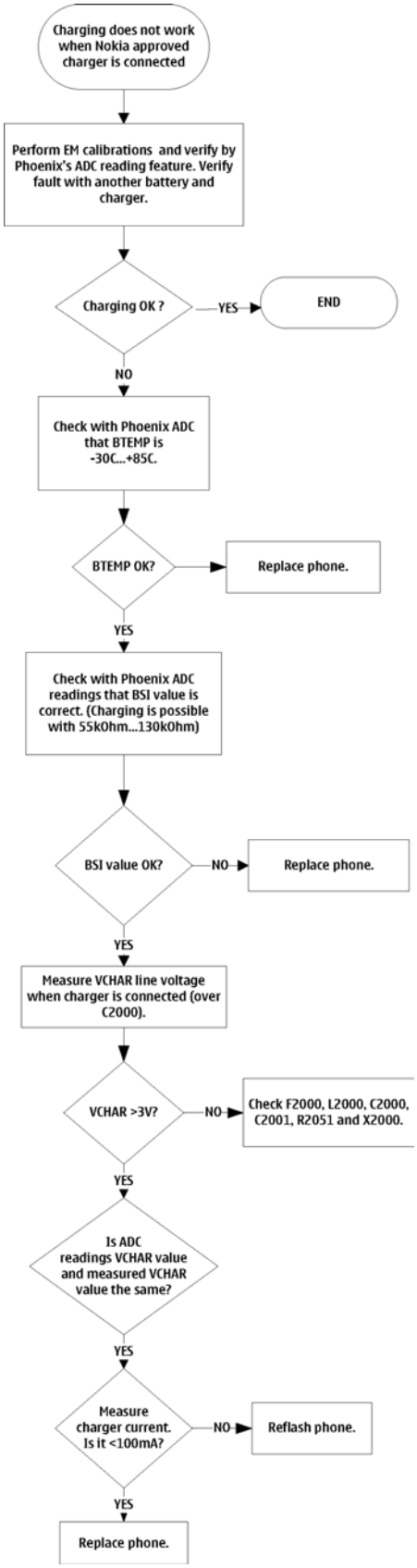
Charging troubleshooting

Troubleshooting flow


Charging does not work when Nokia approved charger is connected
Perform EM calibrations and verify by Phoenix's ADC reading feature. Verify fault with another battery and charger.
Charging OK ?
YES
END
NO
Check with Phoenix ADC that BTEMP is -30C...+85C.
BTEMP OK?
Replace phone.
YES
Check with Phoenix ADC readings that BSI value is correct. (Charging is possible with 55kOhm...130kOhm)
BSI value OK?
NO
Replace phone.
YES
Measure VCHAR line voltage when charger is connected (over C2000).
VCHAR >3V?
NO
Check F2000, L2000, C2000, C2001, R2051 and X2000.
YES
Is ADC readings VCHAR value and measured VCHAR value the same?
YES
Measure charger current. Is it <100mA?
NO
Reflash phone.
YES
Replace phone.

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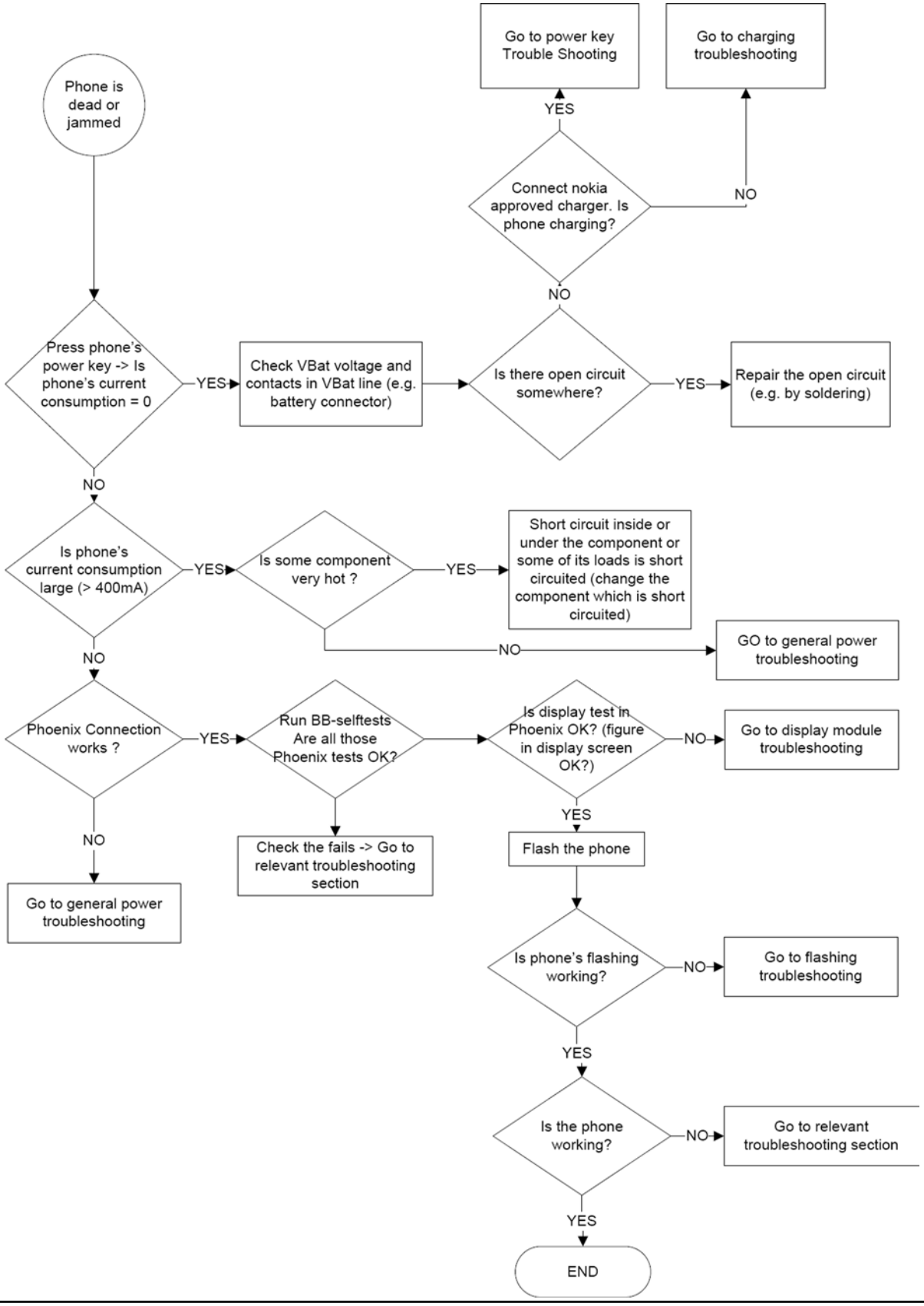
Dead or jammed troubleshooting

Troubleshooting flow


Phone is dead or jammed
Press phone's power key -> Is phone's current consumption = 0
YES
Check VBat voltage and contacts in VBat line (e.g. battery connector)
Is there open circuit somewhere?
YES
Repair the open circuit (e.g. by soldering)
NO
Connect nokia approved charger. Is phone charging?
YES
Go to power key Trouble Shooting
NO
Go to charging troubleshooting
NO
Is phone's current consumption large (> 400mA)
YES
Is some component very hot ?
YES
Short circuit inside or under the component or some of its loads is short circuited (change the component which is short circuited)
NO
GO to general power troubleshooting
NO
Phoenix Connection works ?
YES
Run BB-selftests Are all those Phoenix tests OK?
Is display test in Phoenix OK? (figure in display screen OK?)
NO
Go to display module troubleshooting
YES
Flash the phone
NO
Go to general power troubleshooting
Check the fails -> Go to relevant troubleshooting section
Is phone's flashing working?
NO
Go to flashing troubleshooting
YES
Is the phone working?
NO
Go to relevant troubleshooting section
YES
END

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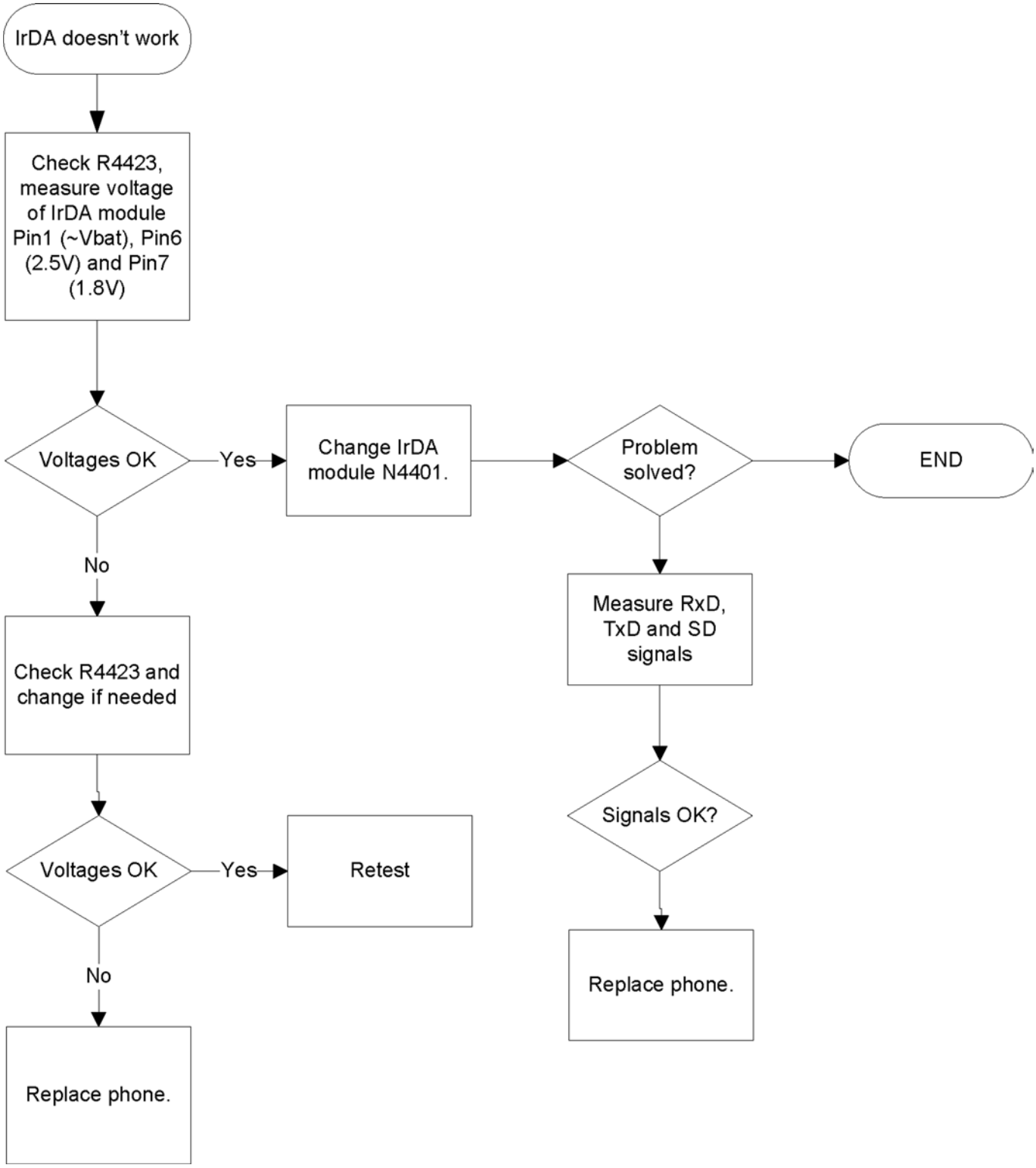
IrDA troubleshooting

Troubleshooting flow



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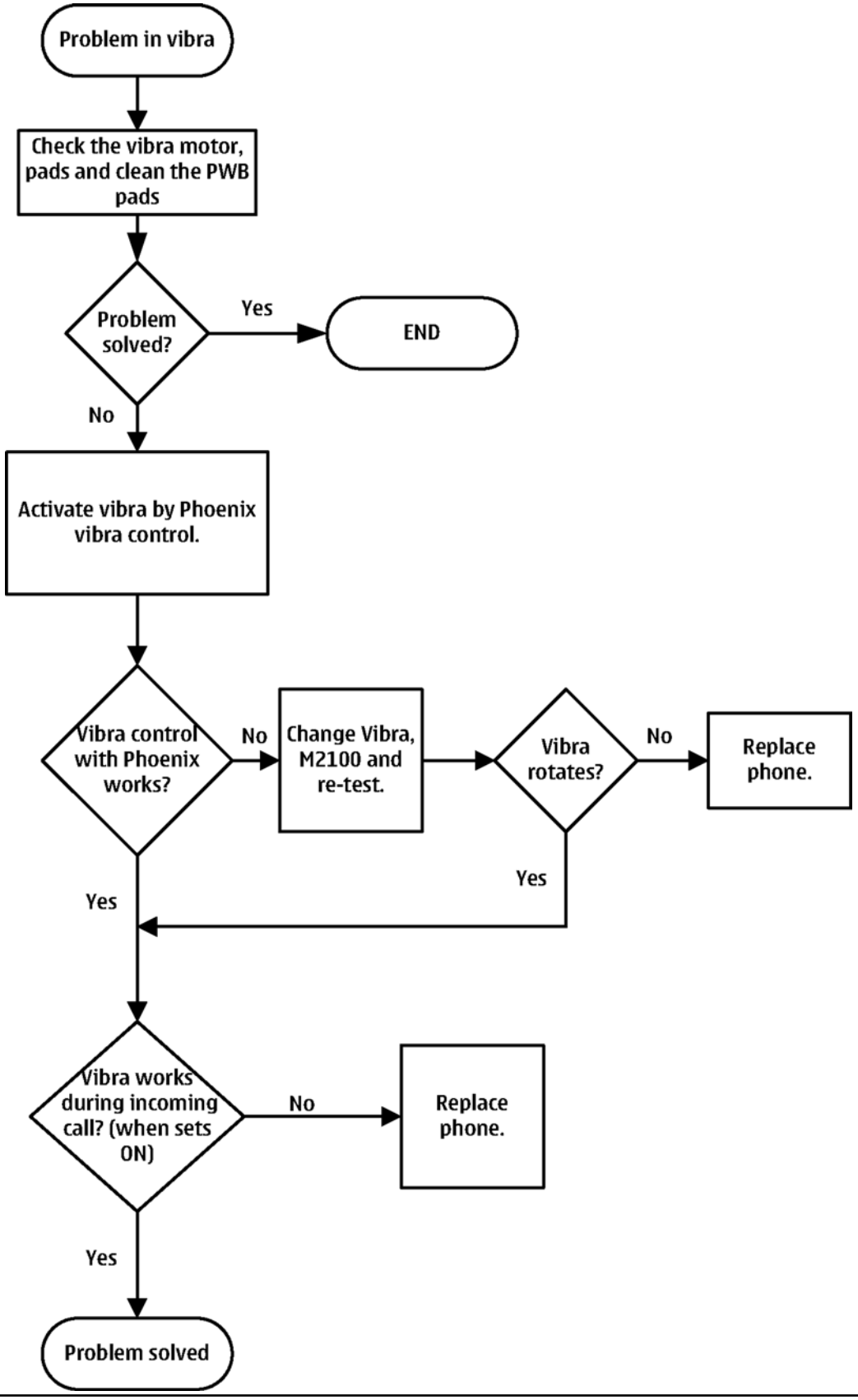
Vibra troubleshooting

Troubleshooting flow



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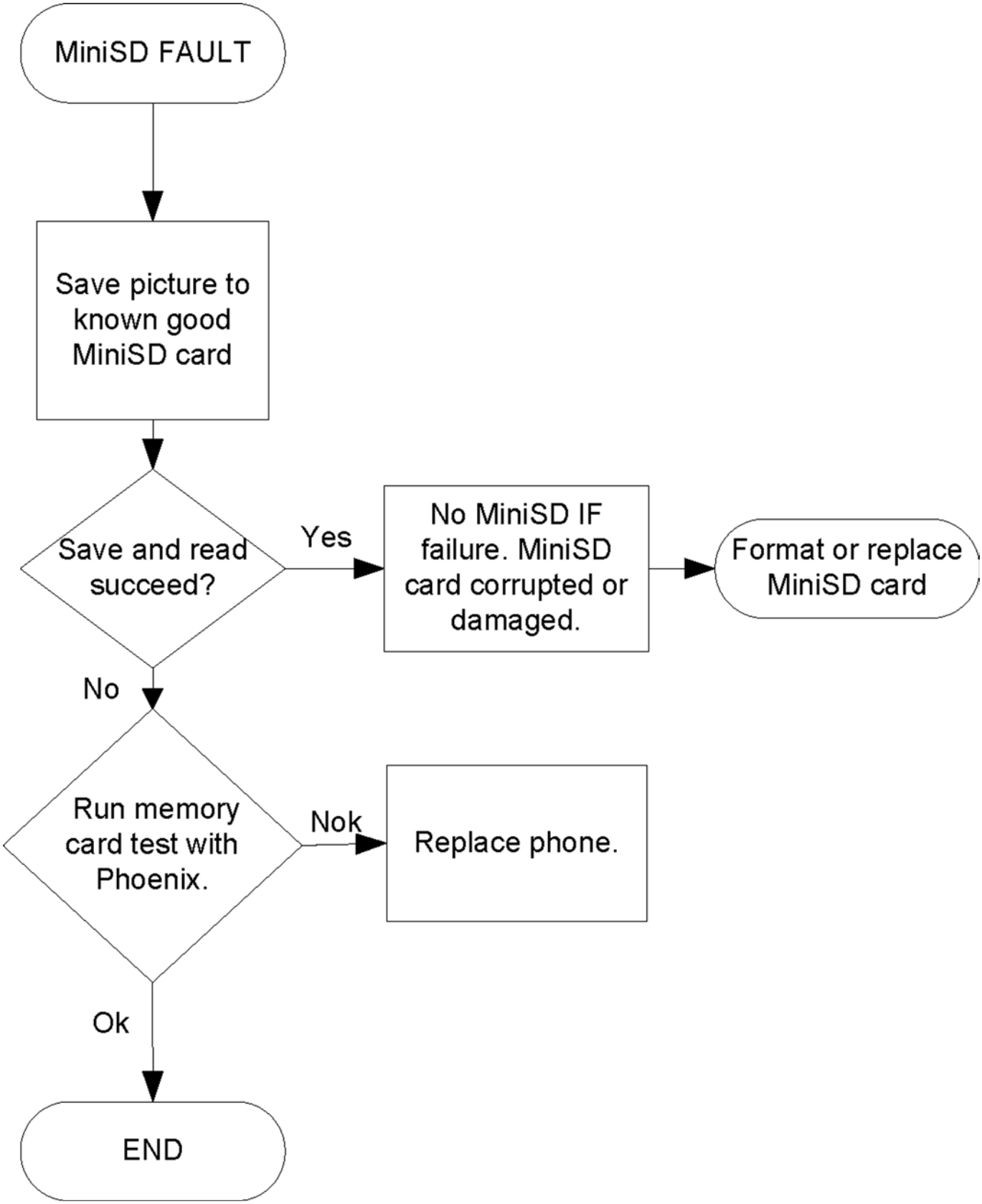
MiniSD troubleshooting

Troubleshooting flow



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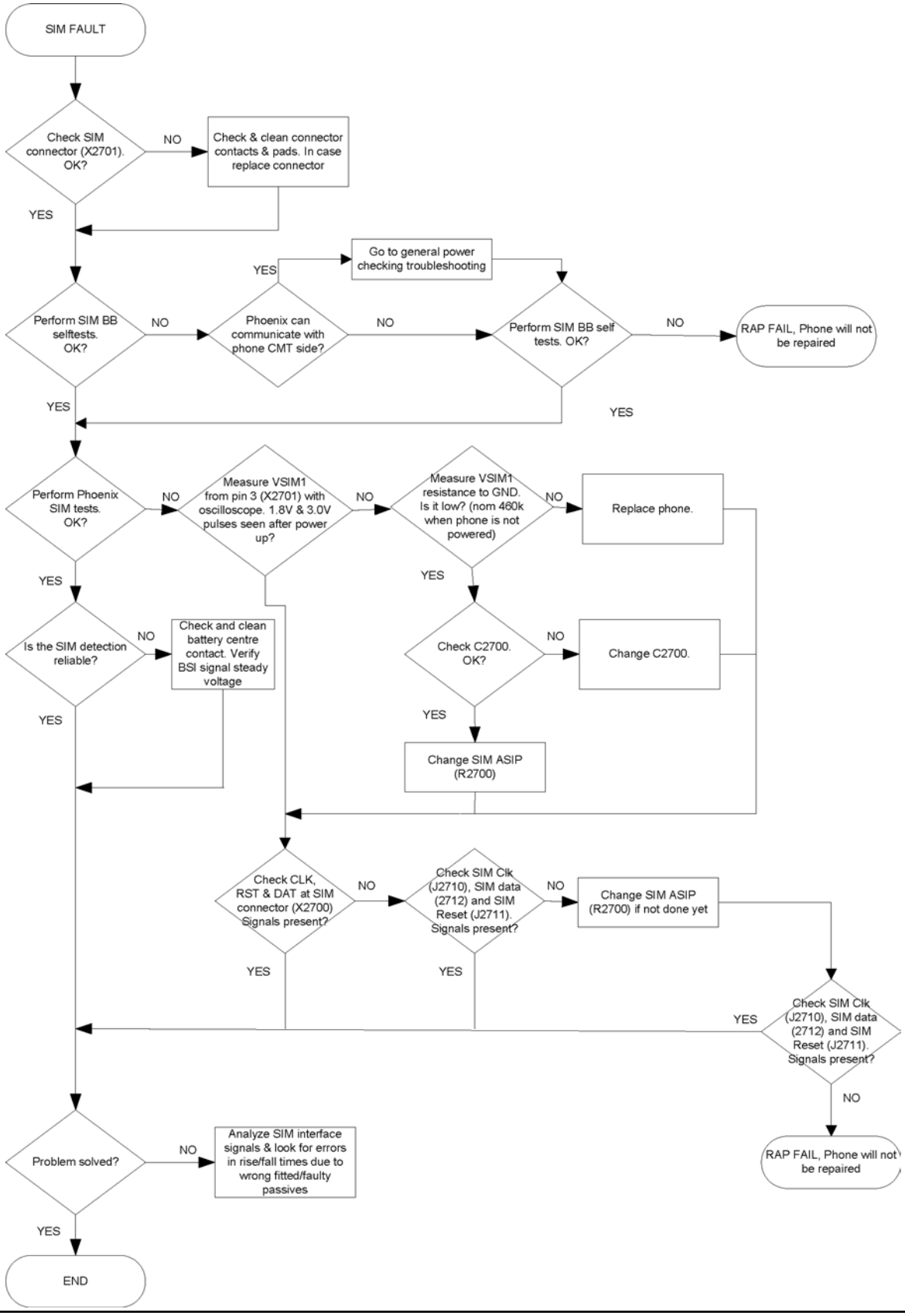
SIM troubleshooting

Troubleshooting flow


SIM FAULT
Check SIM connector (X2701). OK?
NO
Check & clean connector contacts & pads. In case replace connector
YES
YES
Go to general power checking troubleshooting
Perform SIM BB selftests. OK?
NO
Phoenix can communicate with phone CMT side?
NO
Perform SIM BB self tests. OK?
NO
RAP FAIL, Phone will not be repaired
YES
YES
Perform Phoenix SIM tests. OK?
NO
Measure VSIM1 from pin 3 (X2701) with oscilloscope. 1.8V & 3.0V pulses seen after power up?
NO
Measure VSIM1 resistance to GND. Is it low? (nom 460k when phone is not powered)
NO
Replace phone.
YES
YES
Is the SIM detection reliable?
NO
Check and clean battery centre contact. Verify BSI signal steady voltage
Check C2700. OK?
NO
Change C2700.
YES
YES
Change SIM ASIP (R2700)
Check CLK, RST & DAT at SIM connector (X2700) Signals present?
NO
Check SIM Clk (J2710), SIM data (2712) and SIM Reset (J2711). Signals present?
NO
Change SIM ASIP (R2700) if not done yet
YES
YES
YES
Check SIM Clk (J2710), SIM data (2712) and SIM Reset (J2711). Signals present?
NO
RAP FAIL, Phone will not be repaired
Problem solved?
NO
Analyze SIM interface signals & look for errors in rise/fall times due to wrong fitted/faulty passives
YES
END

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Display module troubleshooting

General instructions for display troubleshooting

The first step is to verify with a working display that the fault is not on the display module itself. The display module cannot be repaired.

The second step is to check that the cellular engine is working normally. This can be done by connecting the phone to a docking station and starting Phoenix service software. With the help of Phoenix read the phone information to check that also the application engine is functioning normally (you should be able to read the APE ID).

After these checks proceed to the display troubleshooting flowcharts. Use the Display Test tool in Phoenix to find the detailed fault mode.

Operating modes of the display

The display is in a normal mode when the phone is in active use.

The display is in a partial idle mode when the phone is in the screen saver mode.

The operating modes of the display can be controlled with the help of Phoenix.

Table 9 Display module troubleshooting cases

Display blank	There is no image on the display. The display looks the same when the phone is on as it does when the phone is off. The backlight can be on in some cases.
Image on the display not correct	Image on the display can be corrupted or a part of the image can be missing. If a part of the image is missing, change the display module. If the image is otherwise corrupted, follow the appropriate troubleshooting diagram.
Backlight dim or not working at all	Backlight LED components are inside the display module. Backlight failure can also be in the connector or in the backlight power source in the main engine of the phone. Backlight is also controlled automatically by the ambient light sensor. This means that in case the display is working (image OK), but the backlight is not, follow the Display and Keyboard Backlight troubleshooting.
Visual defects (pixel)	Pixel defects can be checked by controlling the display with Phoenix. Use both colours, black and white, on a full screen. The display may have some random pixel defects that are acceptable for this type of display. The criteria when pixel defects are regarded as a display failure, resulting in a replacement of the display, are presented the following table.

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Table 10 Pixel defects

Item		White dot defect				Black dot defect	Total
1	Defect counts	R	G	B	White Dot Total	1	1
		1	1	1	1		
2	Combined defect counts	Not allowed. Two single dot defects that are within 5 mm of each other should be interpreted as combined dot defect.					

Note: Blinking pixels are not allowed in normal operating temperatures and light conditions.

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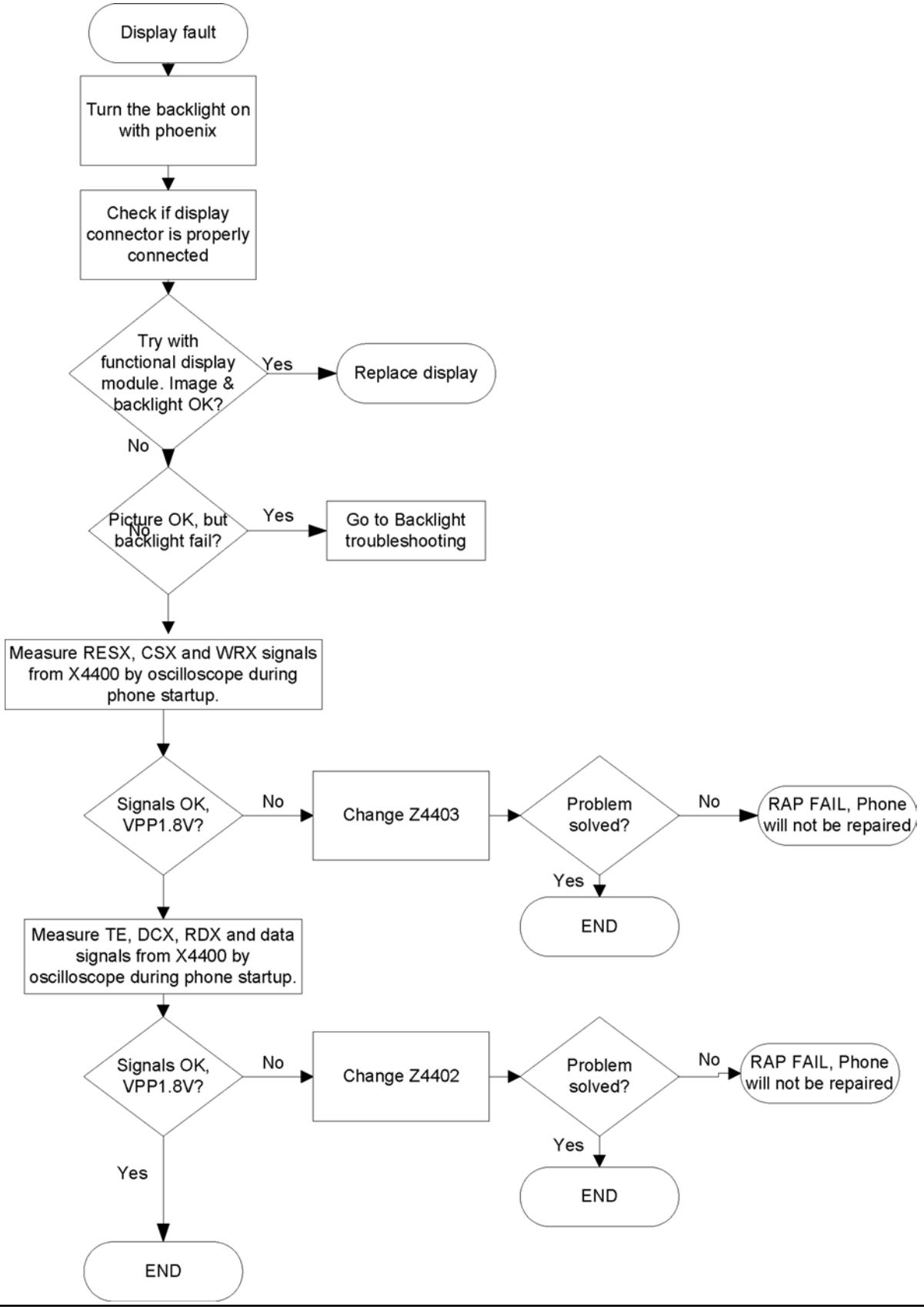
Display fault troubleshooting

Troubleshooting flow



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Display and keyboard backlight troubleshooting

Context

The device has one LED driver that provides current for the display backlight.

The brightness of the display is adjusted by the Ambient Light Sensor (ALS).

You can enable/disable ALS with the help of Phoenix service software.

Display brightness can be adjusted manually, if ALS is disabled. If the ambient light sensor is enabled, it adjusts the display brightness automatically.

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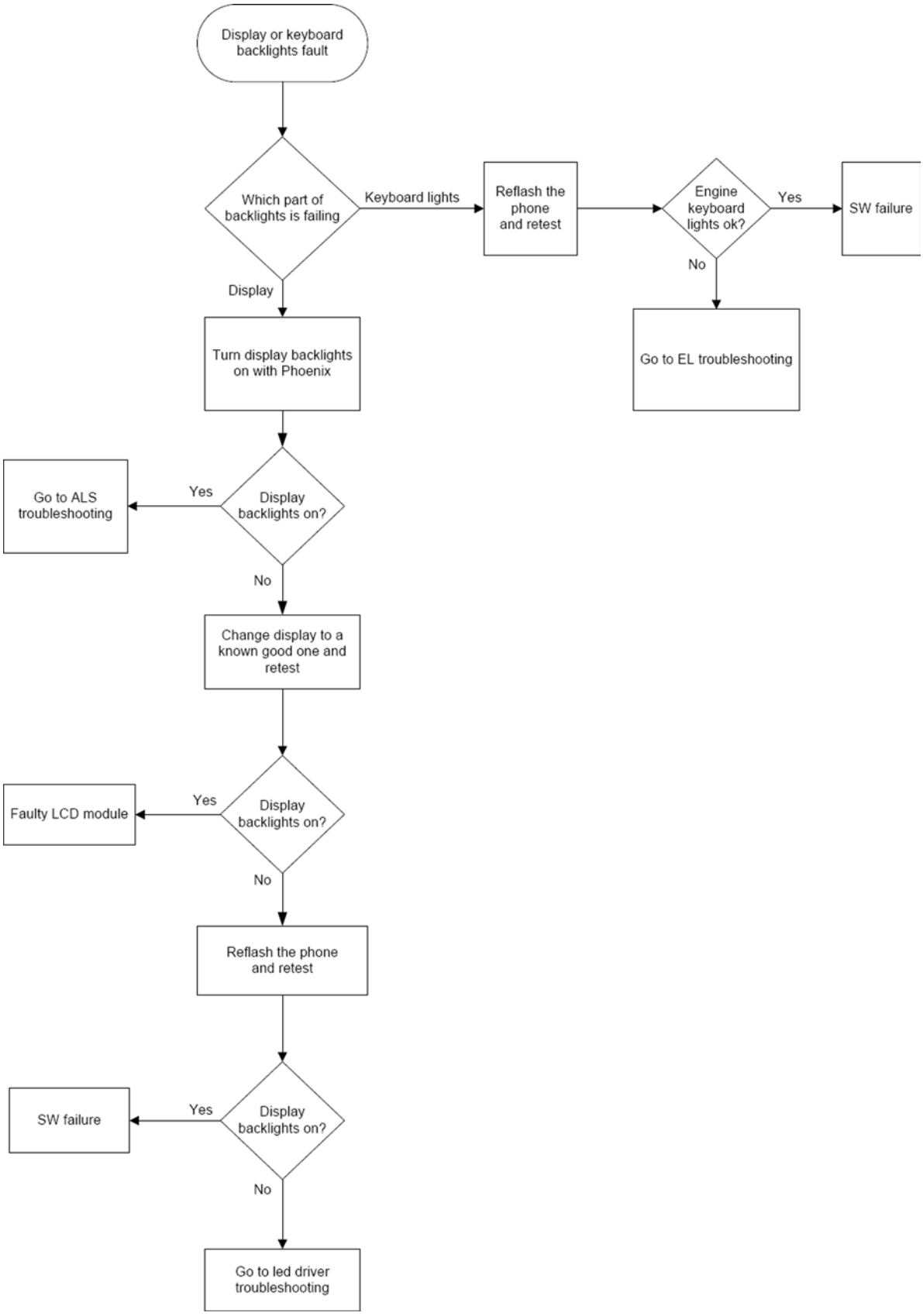
Troubleshooting flow



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Related information

- Display fault troubleshooting (page 6–20)
- LED driver troubleshooting (page 6–28)
- ALS troubleshooting (page 6–25)

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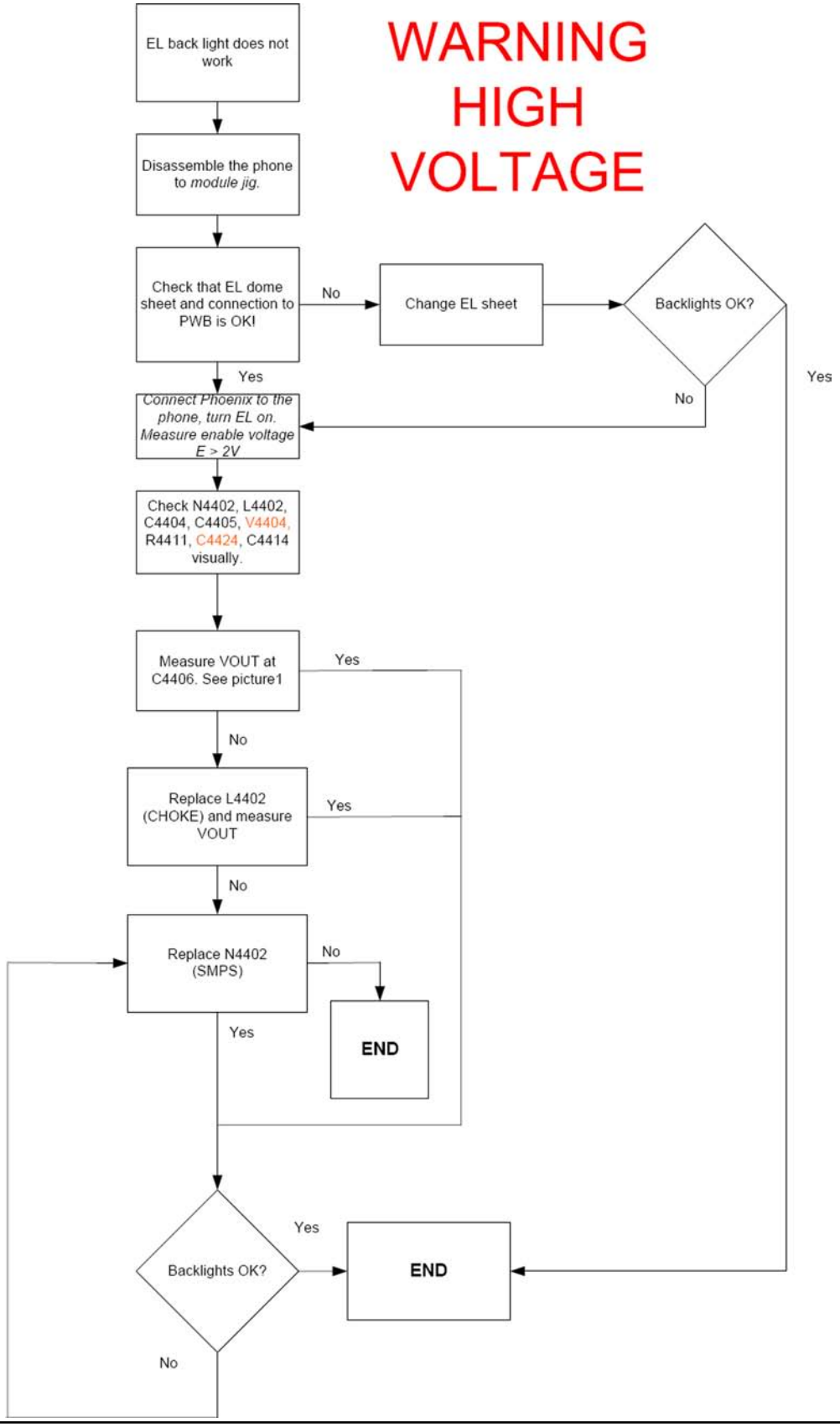
EL backlight fault troubleshooting

Troubleshooting flow



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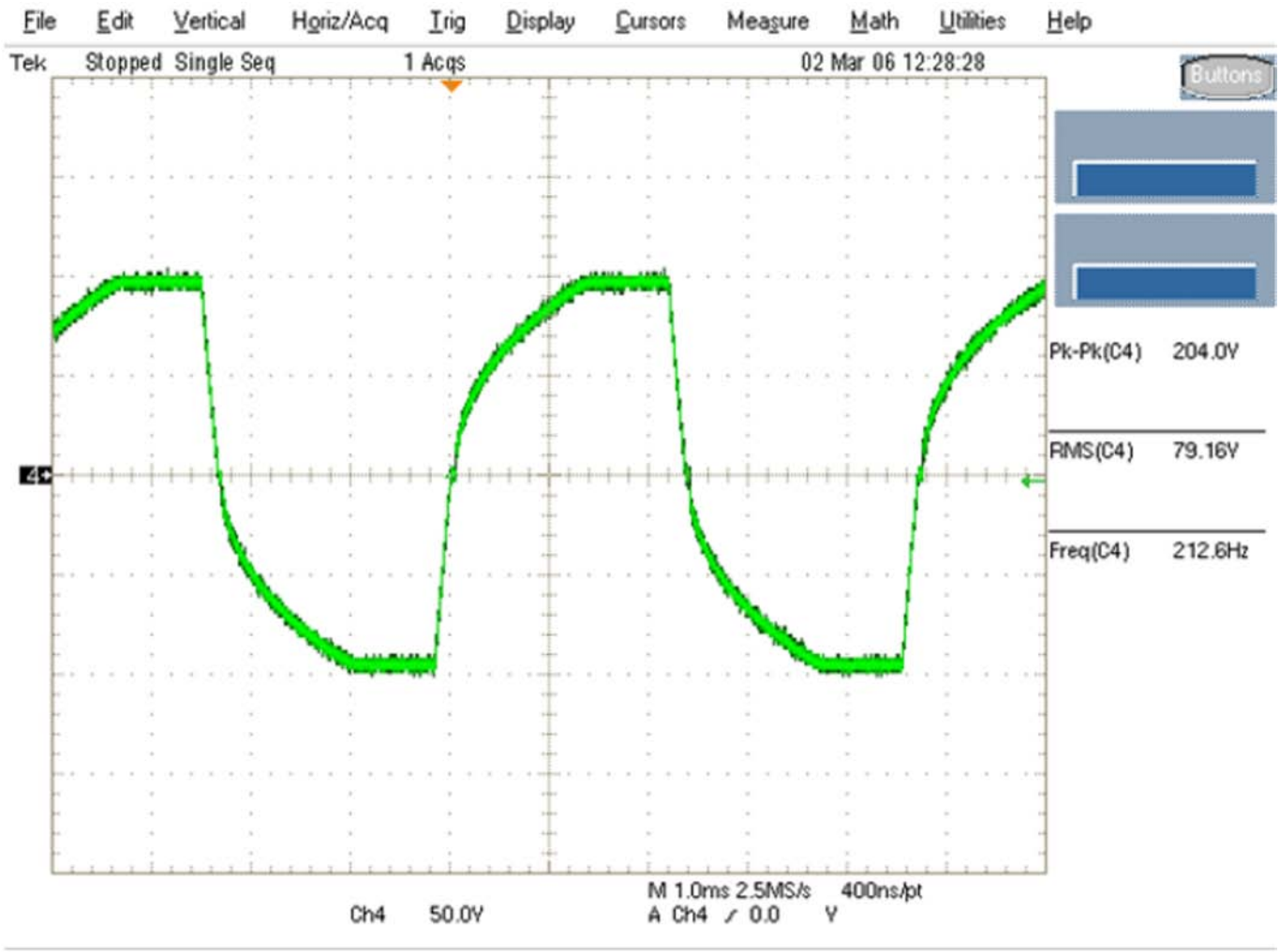
File Edit Vertical Horiz/Acq Trig Display Cursors Measure Math Utilities Help
Tek Stopped Single Seq 1 Acqs 02 Mar 06 12:28:28
Buttons
Pk-Pk(C4) 204.0V
RMS(C4) 79.16V
Freq(C4) 212.6Hz
M 1.0ms 2.5MS/s 400ns/pt
A Ch4 ⁄ 0.0 V
Ch4 50.0V

ALS troubleshooting

Context

- If a phototransistor is broken, replace it with a typical phototransistor.
- After replacing the phototransistor or if calibration values are lost for some other reason, ALS re-tuning is required.
- Before starting the ALS calibration procedure, perform the 'Pull-up resistor calibration' in dark lighting conditions, and write the measured 'correction' value to the phone. After this ALS calibration procedure is performed, and the default co-efficient value '1' is written to the phone.
- Make sure that you have completed **Display and keypad backlight troubleshooting** first before starting **ALS troubleshooting**.

Here are some hints for ALS troubleshooting; the following troubleshooting diagram refers to these:

- *Phoenix* LED control tool also shows you luminance. The correct luminance in darkness is <20 lx, and in office environment 100-2000 lx. The luminance value depends strongly on the light source and the angle of the phone, so these values are only a rough guideline.
- LED driver control voltage measurement points can be found from the **LED driver troubleshooting** section. When backlight brightness is set to 100%, both GENOUT signals are low, and enable PWM is 100%.
- *Phoenix* has an ambient light sensor calibration tool for changing calibration values. The pull-up resistor calibration is done first. See the following procedure.

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Steps

1. Cover the light guide (upper part of the A-Cover).
2. Start *Phoenix*.
3. Choose **File→Scan Product.**
4. Choose **Tuning→Ambient Light Sensor Calibration.**

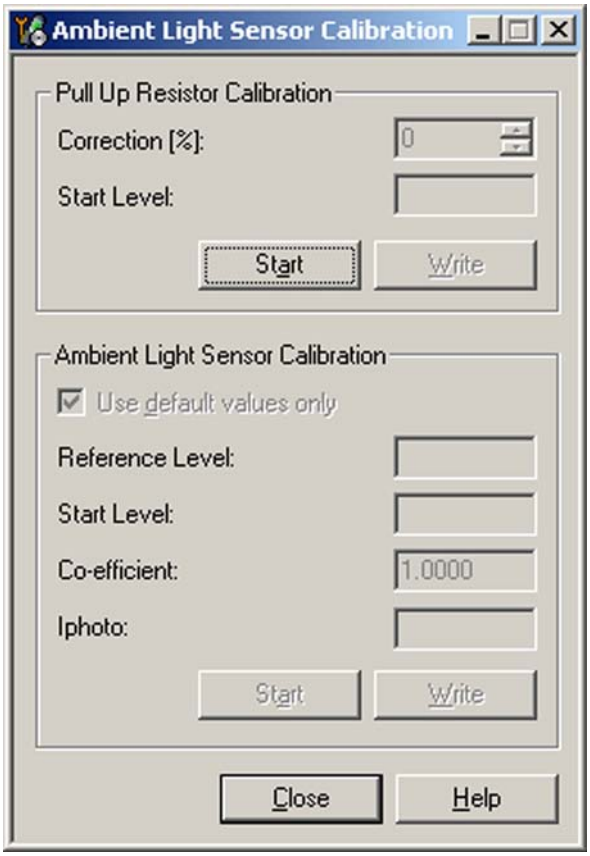

Figure 36 *Ambient Light Sensor Calibration* window

5. In the *Pull Up Resistor Calibration* pane, click **Start**, and **Write**.
6. In the *Ambient Light Sensor Calibration* pane, check the **Use default values only** check box, and click **Write**.
7. To end the calibration, click **Close**.

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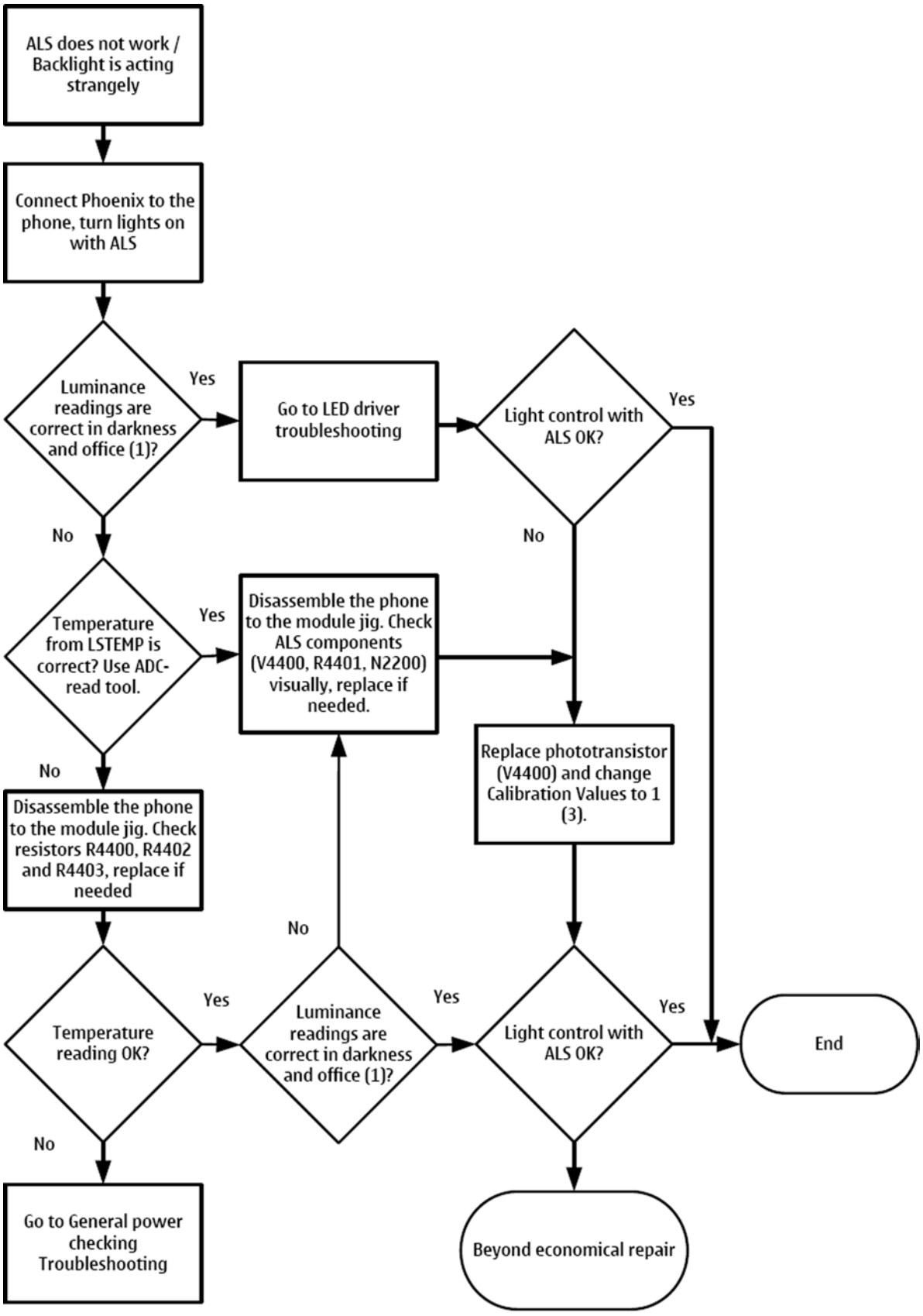
Troubleshooting flow


ALS does not work / Backlight is acting strangely
Connect Phoenix to the phone, turn lights on with ALS
Luminance readings are correct in darkness and office (1)?
Yes
Go to LED driver troubleshooting
Light control with ALS OK?
Yes
No
No
Temperature from LSTEMP is correct? Use ADC-read tool.
Yes
Disassemble the phone to the module jig. Check ALS components (V4400, R4401, N2200) visually, replace if needed.
Replace phototransistor (V4400) and change Calibration Values to 1 (3).
No
Disassemble the phone to the module jig. Check resistors R4400, R4402 and R4403, replace if needed
No
Temperature reading OK?
Yes
Luminance readings are correct in darkness and office (1)?
Yes
Light control with ALS OK?
Yes
End
No
Go to General power checking Troubleshooting
Beyond economical repair

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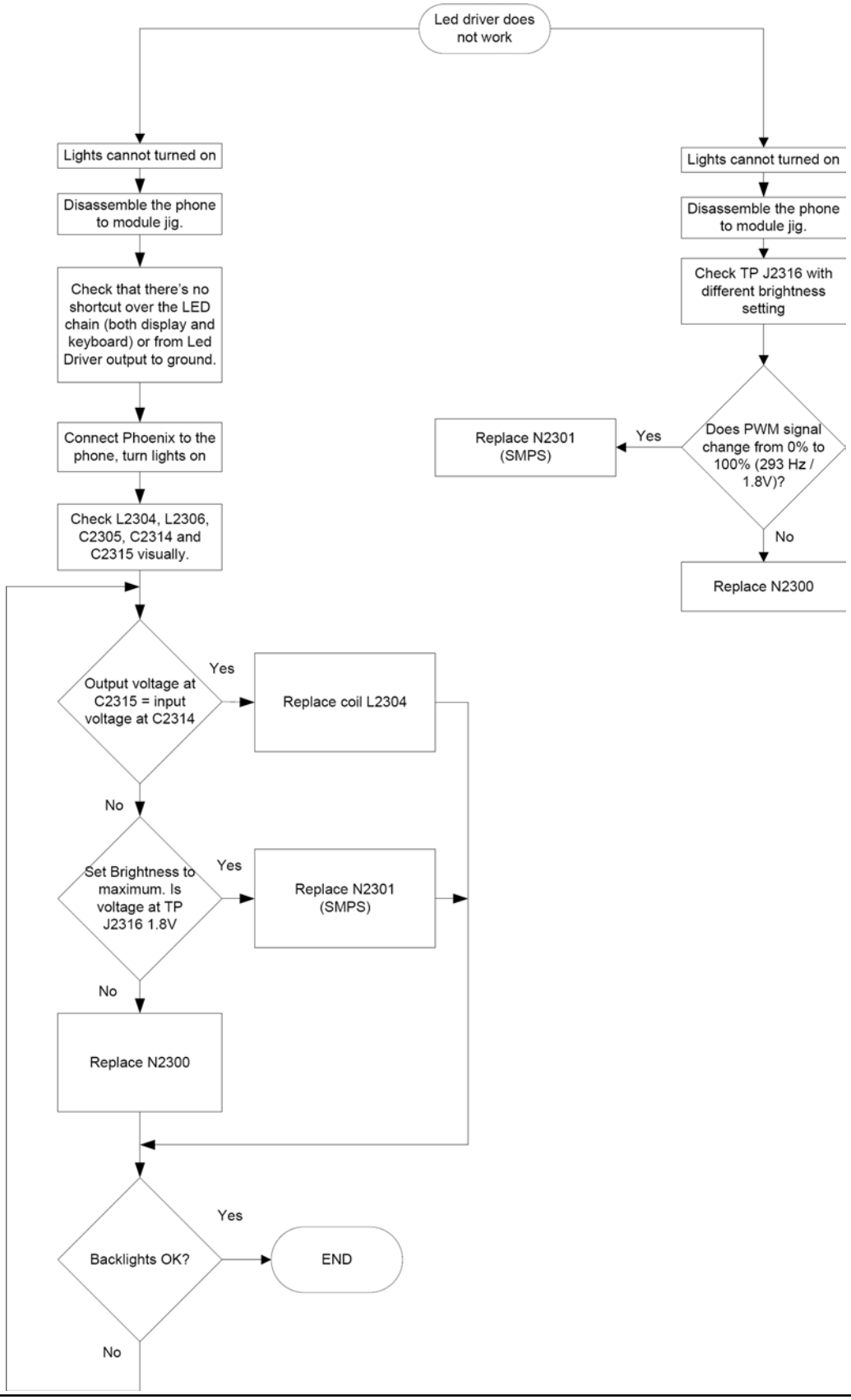
LED driver troubleshooting

Troubleshooting flow


Led driver does not work
Lights cannot turned on
Disassemble the phone to module jig.
Check that there's no shortcut over the LED chain (both display and keyboard) or from Led Driver output to ground.
Connect Phoenix to the phone, turn lights on
Check L2304, L2306, C2305, C2314 and C2315 visually.
Output voltage at C2315 = input voltage at C2314
Yes
Replace coil L2304
No
Set Brightness to maximum. Is voltage at TP J2316 1.8V
Yes
Replace N2301 (SMPS)
No
Replace N2300
Backlights OK?
Yes
END
No
Lights cannot turned on
Disassemble the phone to module jig.
Check TP J2316 with different brightness setting
Does PWM signal change from 0% to 100% (293 Hz / 1.8V)?
Yes
Replace N2301 (SMPS)
No
Replace N2300

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Bluetooth troubleshooting

Introduction to Bluetooth troubleshooting

There are two main Bluetooth problems that can occur:

Problem	Description
Detachment of the BT antenna.	This would most likely happen if the device has been dropped repeatedly to the ground. It could cause the BT antenna to become loose or partially detached from the PWB. (see next page for details about BT antenna HW and Mechanics)
A malfunction in the BT ASIC, BB ASICs or Phone's BT SMD components.	This is unpredictable and could have many causes i.e. SW or HW related.

The main issue is to find out if the problem is related to the BT antenna or related to the BT system or the phone's BB and then replace/fix the faulty component.

Bluetooth settings for Phoenix

Steps

1. Start *Phoenix* service software.
2. From the **File** menu, choose **Open Product**, and then choose the correct type designator from the **Product** list.
3. Place the phone to a flash adapter in the local mode.
4. Choose **Testing→Bluetooth LOCALS** .
5. Locate JBT-9's serial number (12 digits) found in the type label on the back of JBT-9.

   In addition to JBT-9, also SB-6, JBT-3 and JBT-6 Bluetooth test boxes can be used.
6. In the *Bluetooth LOCALS* window, write the 12-digit serial number on the **Counterpart BT Device Address** line.

   This needs to be done only once provided that JBT-9 is not changed.
7. Place the JBT-9 box near (within 10 cm) the BT antenna and click **Run BER Test**.

Results

Bit Error Rate test result is displayed in the *Bit Error Rate (BER) Tests* pane in the *Bluetooth LOCALS* window.

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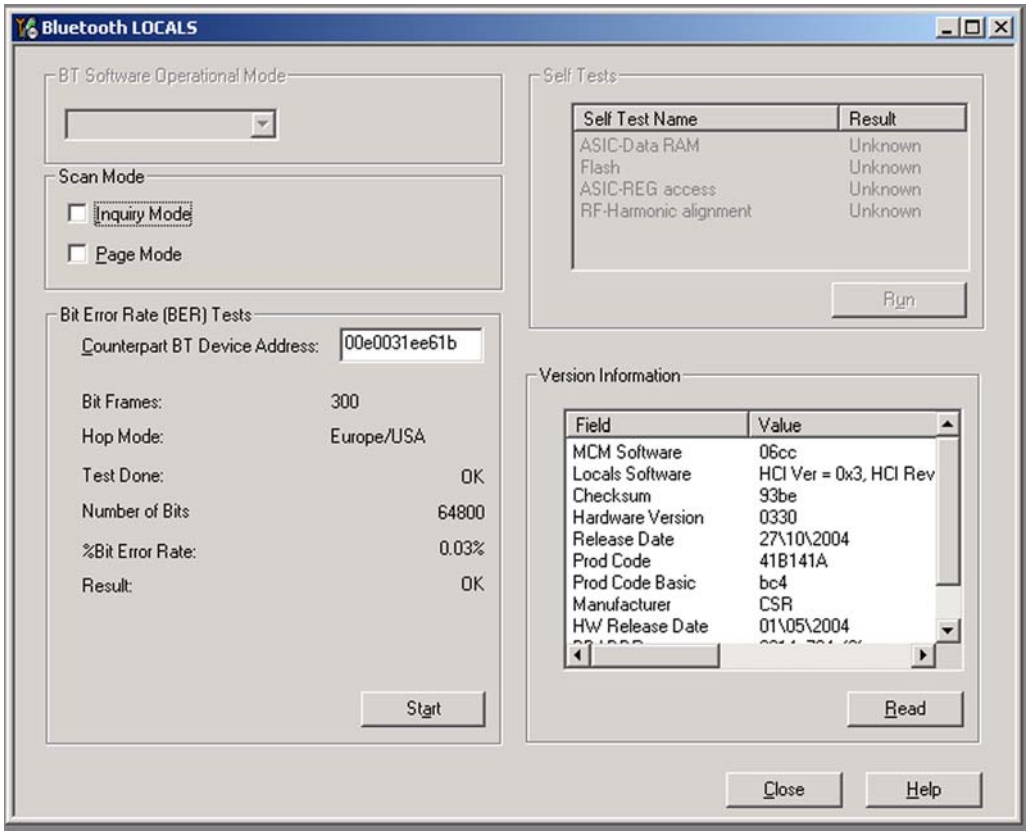

Figure 37 BER test result

Bluetooth self tests in Phoenix

Steps

1. Start *Phoenix* service software.
2. Choose**File→Scan Product.**
3. Place the phone to a flash adapter.
4. From the **Mode** drop-down menu, set mode to **Local**.
5. Choose **Testing→Self Tests.**
6. In the *Self Tests* window check the following Bluetooth related tests:
   - **ST_LPRF_IF_TEST**
   - **ST_LPRF_AUDIO_LINES_TEST**
   - **ST_BT_WAKEUP_TEST**

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7. To run the tests, click **Start**.

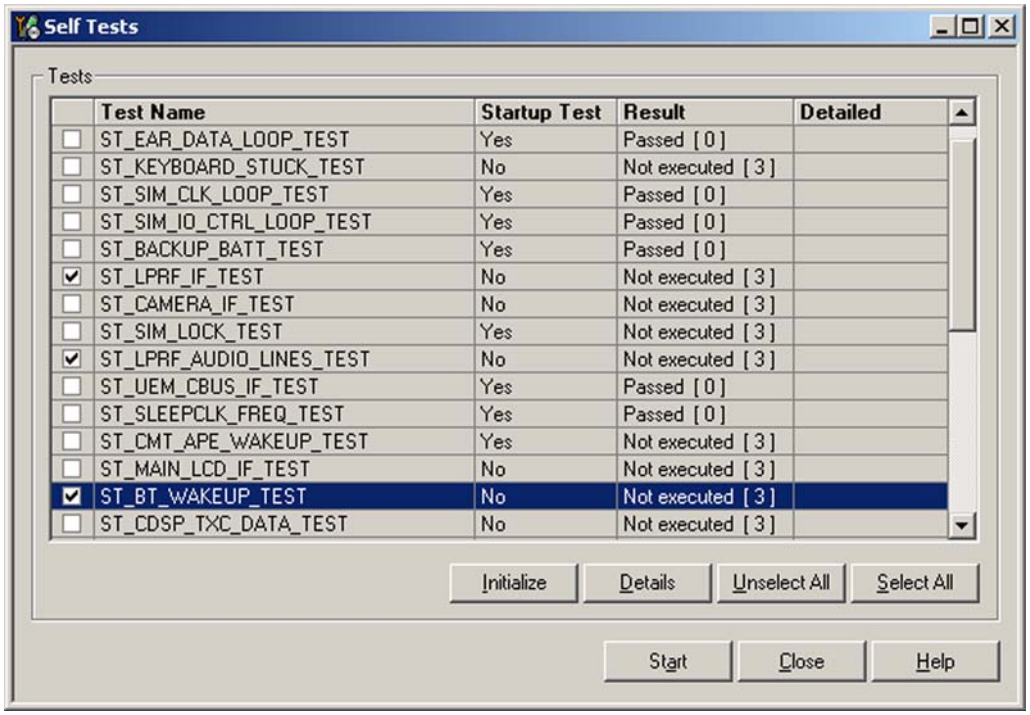

Figure 38 Bluetooth self tests in *Phoenix*

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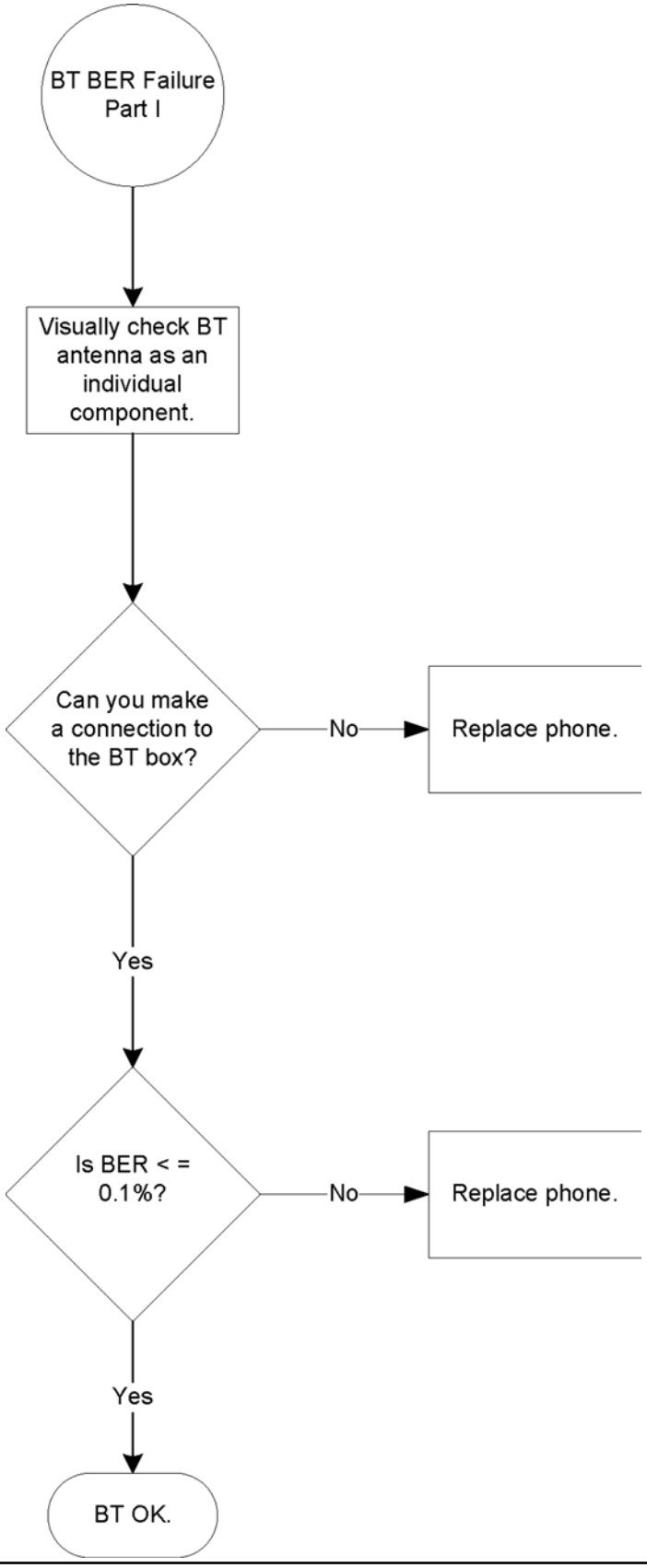
Bluetooth BER failure troubleshooting

Troubleshooting flow



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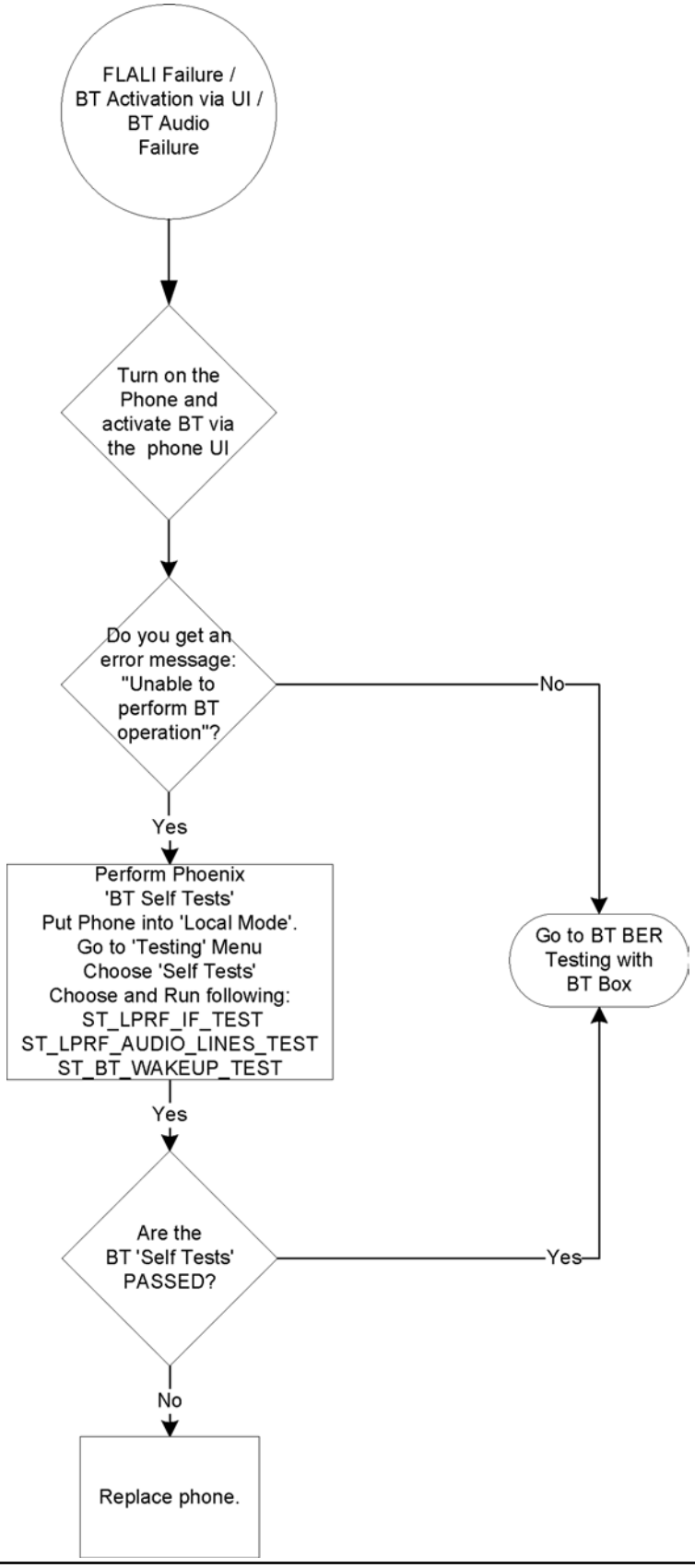
BT audio failure troubleshooting

Troubleshooting flow


FLALI Failure / BT Activation via UI / BT Audio Failure
Turn on the Phone and activate BT via the phone UI
Do you get an error message: "Unable to perform BT operation"?
No
Yes
Perform Phoenix 'BT Self Tests' Put Phone into 'Local Mode'. Go to 'Testing' Menu Choose 'Self Tests' Choose and Run following: ST_LPRF_IF_TEST ST_LPRF_AUDIO_LINES_TEST ST_BT_WAKEUP_TEST
Go to BT BER Testing with BT Box
Yes
Are the BT 'Self Tests' PASSED?
Yes
No
Replace phone.

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Audio troubleshooting

Audio troubleshooting test instructions

Differential external earpiece and internal earpiece outputs can be measured either with a single-ended or a differential probe.

When measuring with a single-ended probe each output is measured against the ground.

Internal handsfree output is measured using a current probe, if a special low-pass filter designed for measuring a digital amplifier is not available. Note also that when using a current probe, the input signal frequency must be set to 2kHz.

The input signal for each loop test can be either single-ended or differential.

Required equipment

The following equipment is needed for the tests:

- Oscilloscope
- Function generator (sine waveform)
- Current probe (Internal handsfree PWM output measurement)
- Phoenix service software
- Battery voltage 3.7V

Test procedure

Audio can be tested using the Phoenix audio routings option. Three different audio loop paths can be activated:

- External microphone to Internal earpiece
- External microphone to Internal handsfree speaker
- Internal microphone to External earpiece

Each audio loop sets routing from the specified input to the specified output enabling a quick in-out test. Loop path gains are fixed and they cannot be changed using Phoenix. Correct pins and signals for each test are presented in the following table.

Phoenix audio loop tests and test results

The results presented in the table apply when no accessory is connected and battery voltage is set to 3.7V.

Earpiece, internal microphone and speaker are in place during measurement. Applying a headset accessory during measurement causes a significant drop in measured quantities.

The gain values presented in the table apply for a differential output vs. single-ended/differential input.

Loop test	Input terminal	Output terminal	Path gain [dB] (fixed)	Input voltage [mVp-p]	Differential output voltage [mVp-p]	Output DC level [V]	Output current [mA]
External Mic to Internal Earpiece	XMICP and GND	EarP and GND	35	100	920	1.2	NA
		EarN and GND					

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Loop test	Input terminal	Output terminal	Path gain [dB] (fixed)	Input voltage [mVp-p]	Differential output voltage [mVp-p]	Output DC level [V]	Output current [mA]
External Mic to Internal Handsfree	XMICP and GND	B2102 pads	32	100	-	0	80mA +/- 10mA
Internal Mic to External Earpiece	B2100 (OUT/ GND)	XEARL and GND	35	100	1360	0	NA
		XEARR and GND					

Measurement data

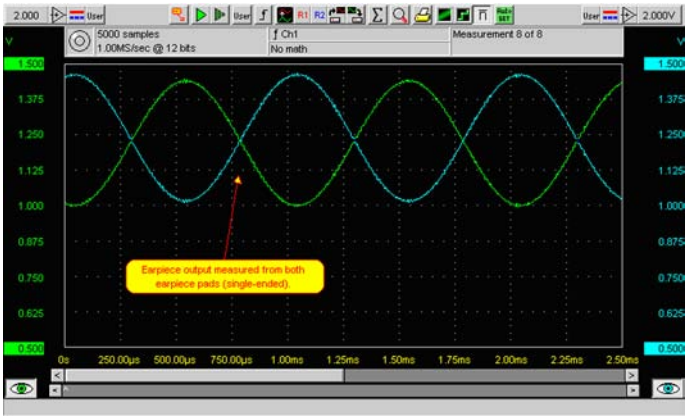

Figure 39 Single-ended output waveform of the Ext_in_HP_out measurement when earpiece is connected.

2000 samples
100.00MS/sec @ 8 bits
Ch1
No math
Measurement 1 of 1
PWM waveform at speaker terminal without filtering, measured re GND with offset (-4 V) in blue trace

Figure 40 Differential output waveform of the Ext_in_IHF_out out loop measurement when speaker is connected.

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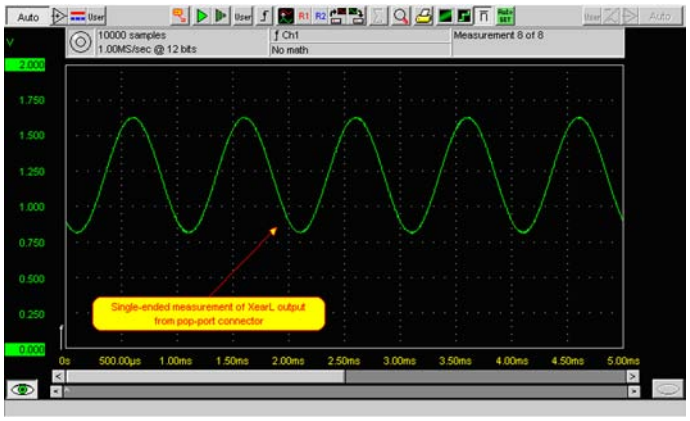

Figure 41 Single-ended output waveform of the HP_in_Ext_out loop when microphone is connected.

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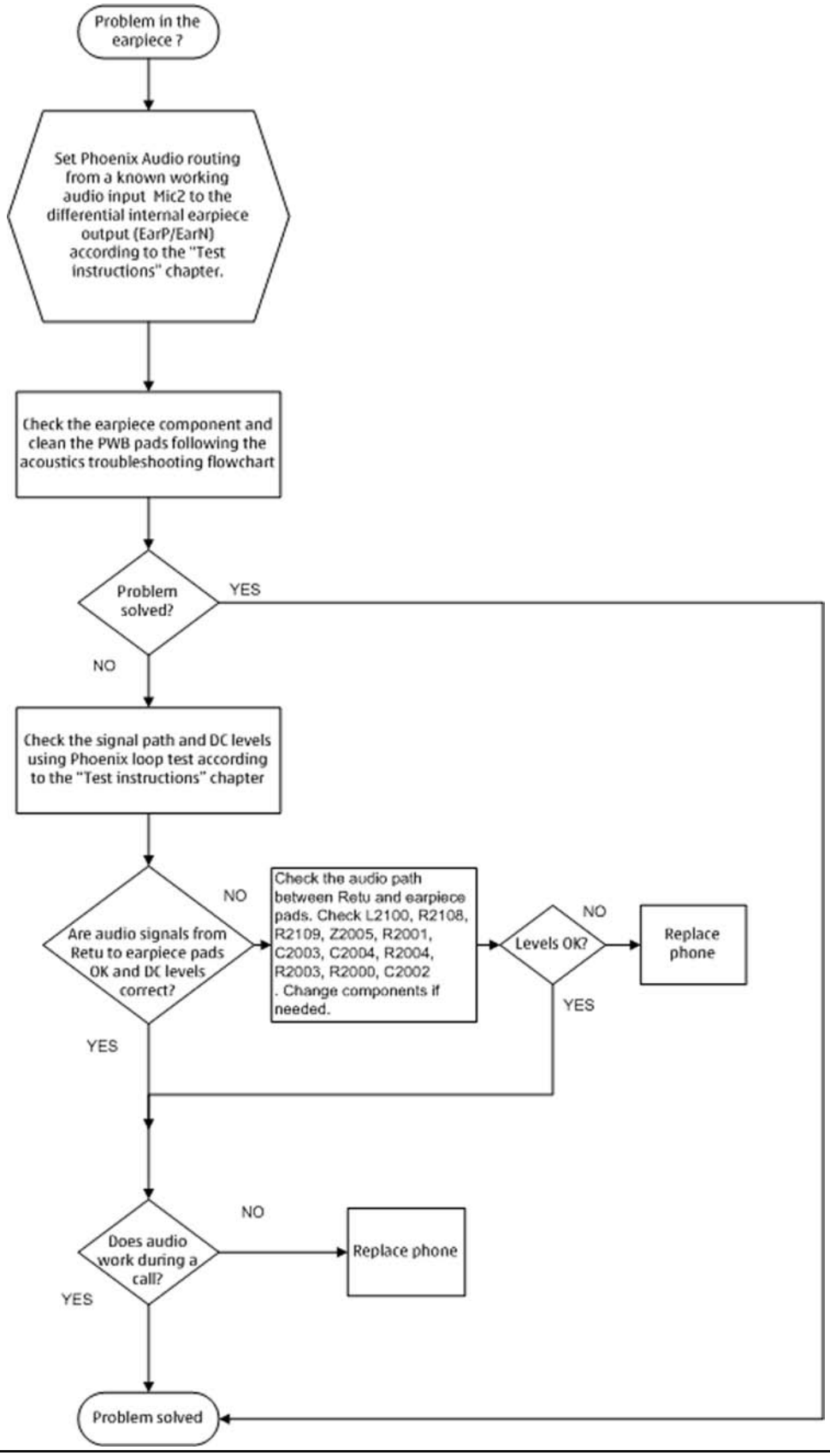
Internal earpiece troubleshooting

Troubleshooting flow


Problem in the earpiece ?
Set Phoenix Audio routing from a known working audio input Mic2 to the differential internal earpiece output (EarP/EarN) according to the "Test instructions" chapter.
Check the earpiece component and clean the PWB pads following the acoustics troubleshooting flowchart
Problem solved?
YES
NO
Check the signal path and DC levels using Phoenix loop test according to the "Test instructions" chapter
Are audio signals from Retu to earpiece pads OK and DC levels correct?
NO
Check the audio path between Retu and earpiece pads. Check L2100, R2108, R2109, Z2005, R2001, C2003, C2004, R2004, R2003, R2000, C2002 . Change components if needed.
Levels OK?
NO
Replace phone
YES
YES
Does audio work during a call?
NO
Replace phone
YES
Problem solved

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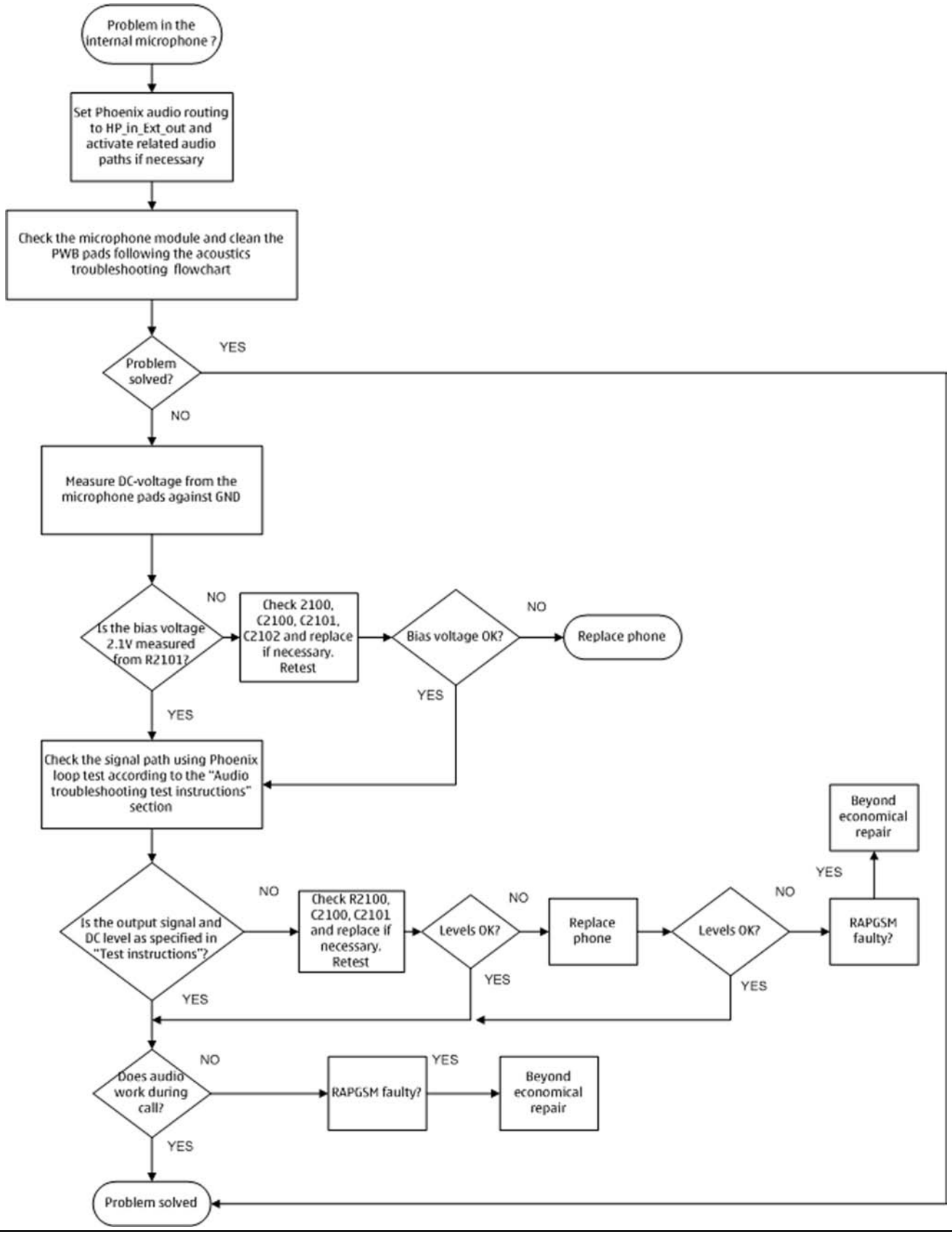
Internal microphone troubleshooting

Troubleshooting flow



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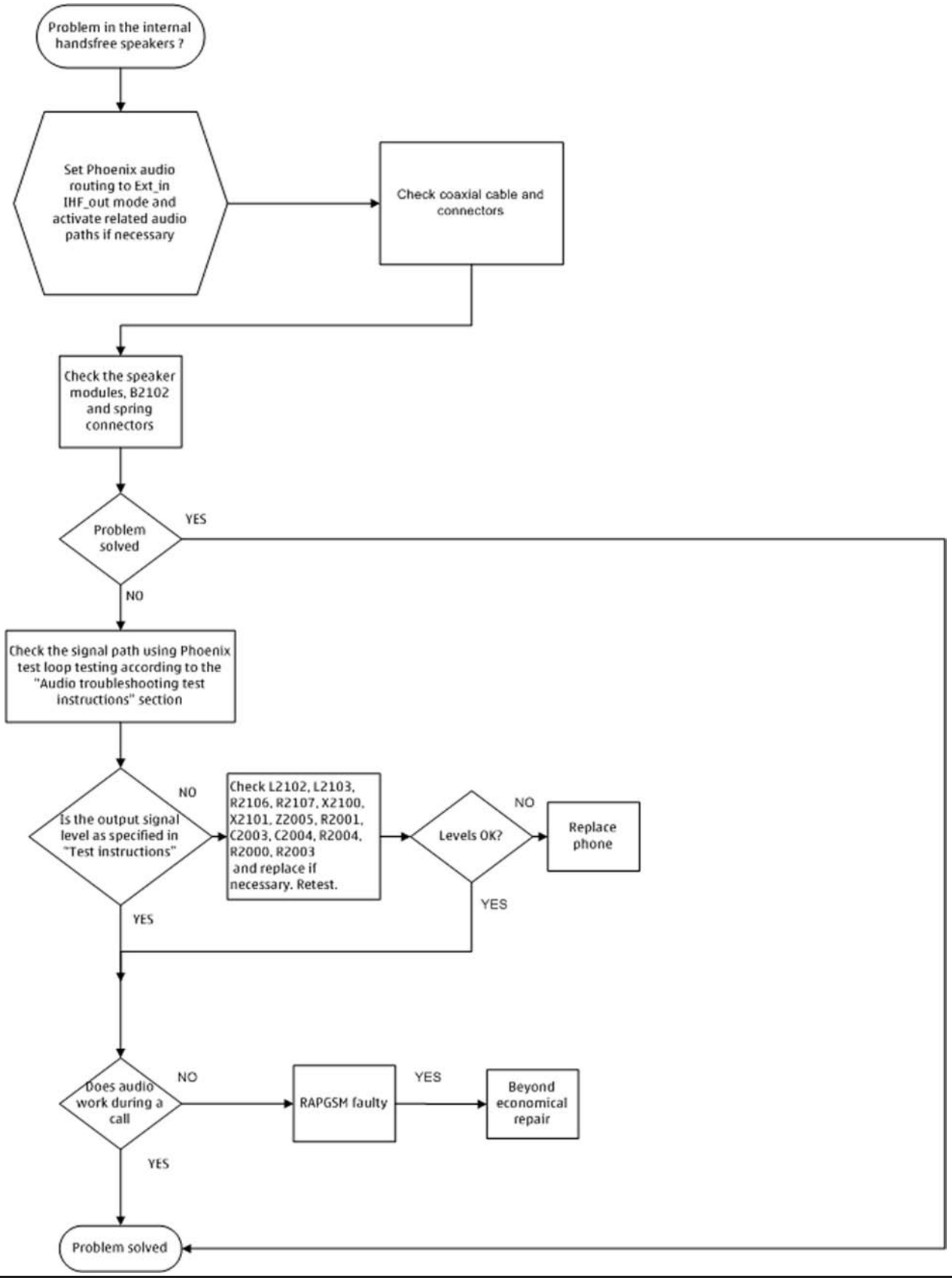
IHF troubleshooting

Troubleshooting flow


Problem in the internal handsfree speakers ?
Set Phoenix audio routing to Ext_in IHF_out mode and activate related audio paths if necessary
Check coaxial cable and connectors
Check the speaker modules, B2102 and spring connectors
Problem solved
YES
NO
Check the signal path using Phoenix test loop testing according to the "Audio troubleshooting test instructions" section
Is the output signal level as specified in "Test instructions"
NO
Check L2102, L2103, R2106, R2107, X2100, X2101, Z2005, R2001, C2003, C2004, R2004, R2000, R2003 and replace if necessary. Retest.
Levels OK?
NO
Replace phone
YES
YES
Does audio work during a call
NO
RAPGSM faulty
YES
Beyond economical repair
YES
Problem solved

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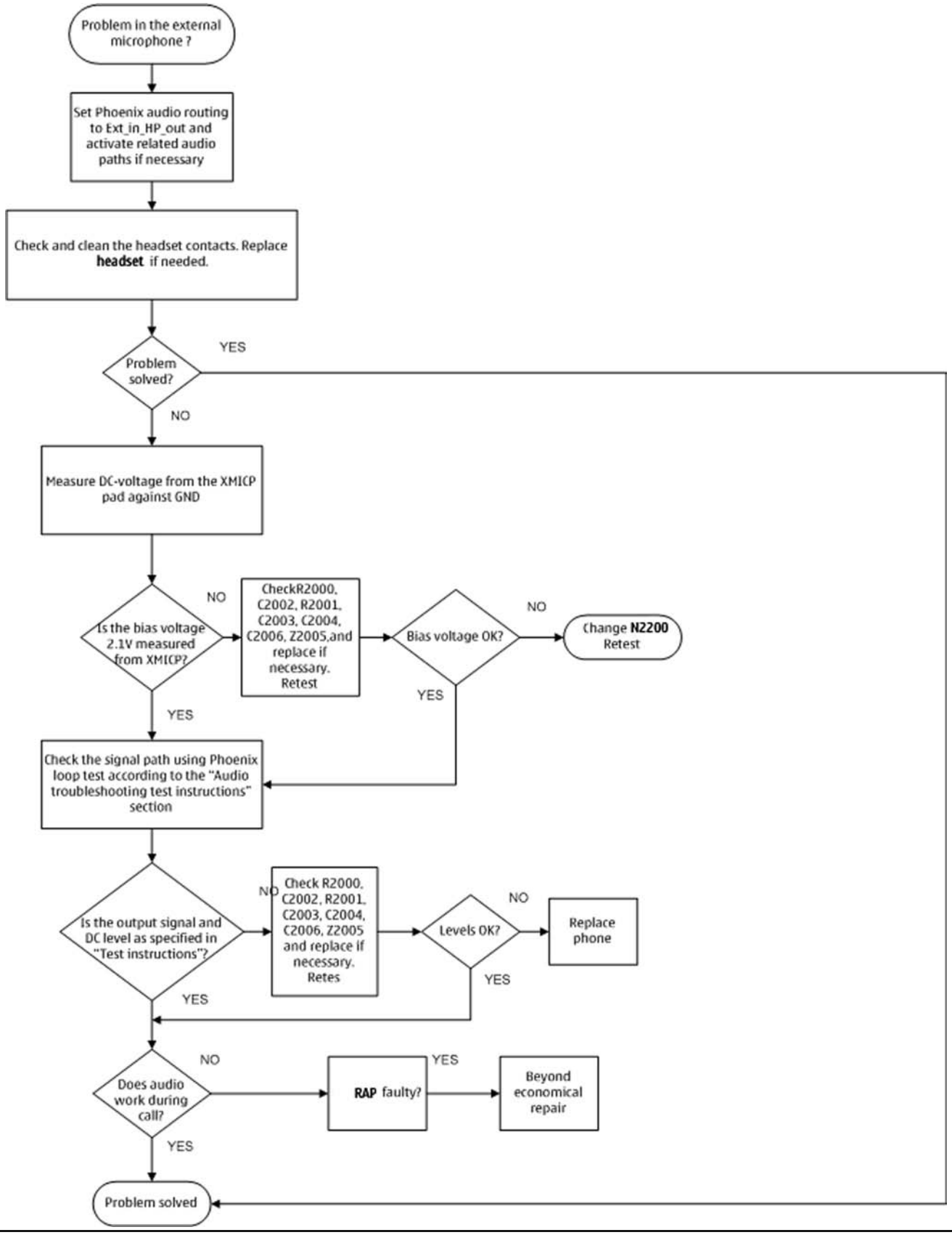
External microphone troubleshooting

Troubleshooting flow


Problem in the external microphone ?
Set Phoenix audio routing to Ext_in_HP_out and activate related audio paths if necessary
Check and clean the headset contacts. Replace **headset** if needed.
Problem solved?
YES
NO
Measure DC-voltage from the XMICP pad against GND
Is the bias voltage 2.1V measured from XMICP?
NO
CheckR2000, C2002, R2001, C2003, C2004, C2006, Z2005,and replace if necessary. Retest
Bias voltage OK?
NO
Change **N2200** Retest
YES
YES
Check the signal path using Phoenix loop test according to the "Audio troubleshooting test instructions" section
Is the output signal and DC level as specified in "Test instructions"?
NO
Check R2000, C2002, R2001, C2003, C2004, C2006, Z2005 and replace if necessary. Retes
Levels OK?
NO
Replace phone
YES
YES
Does audio work during call?
NO
RAP faulty?
YES
Beyond economical repair
YES
Problem solved

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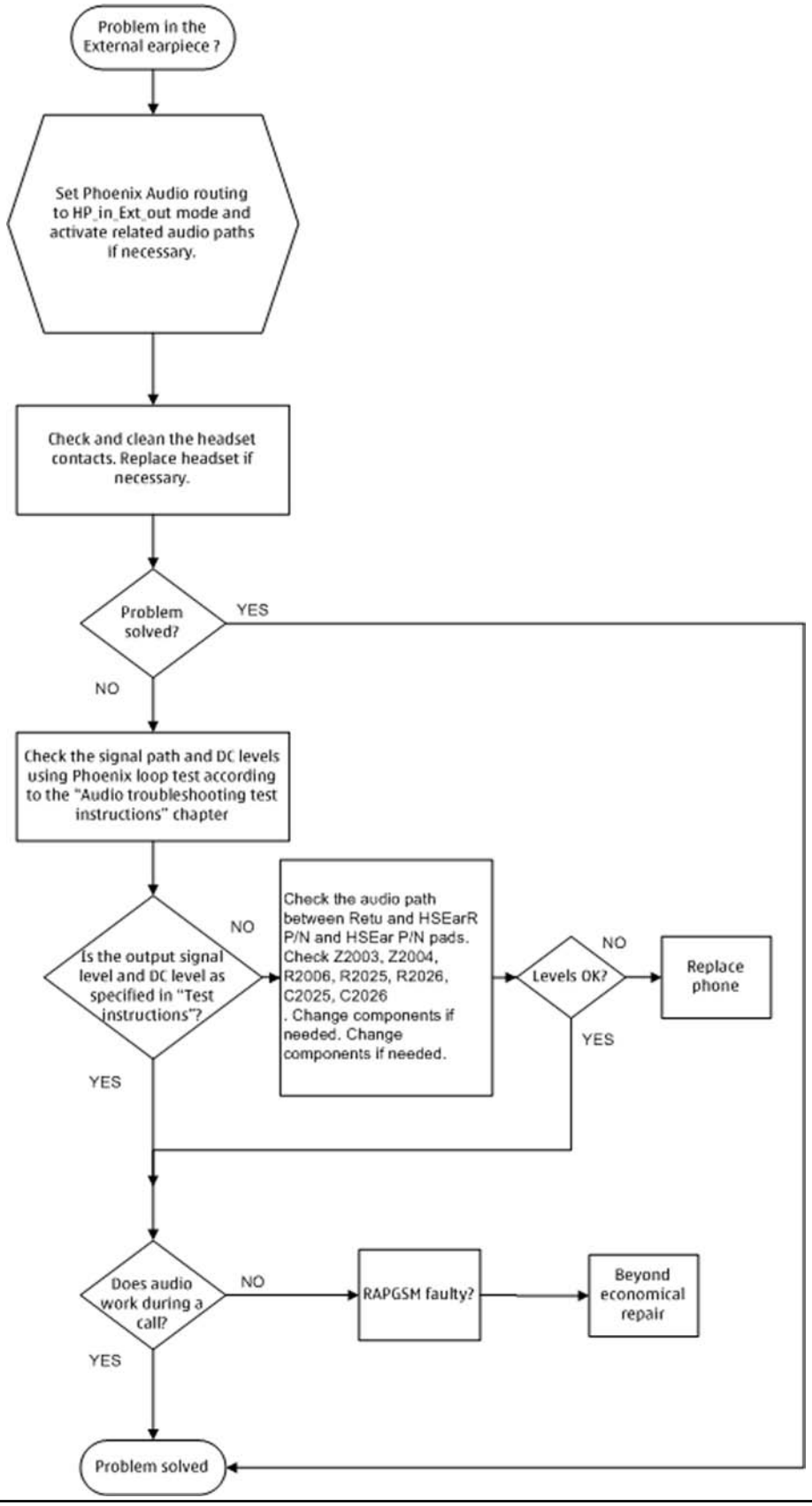
External earpiece troubleshooting

Troubleshooting flow


Problem in the External earpiece ?
Set Phoenix Audio routing to HP_in_Ext_out mode and activate related audio paths if necessary.
Check and clean the headset contacts. Replace headset if necessary.
Problem solved?
YES
NO
Check the signal path and DC levels using Phoenix loop test according to the "Audio troubleshooting test instructions" chapter
Is the output signal level and DC level as specified in "Test instructions"?
NO
YES
Check the audio path between Retu and HSEarR P/N and HSEar P/N pads. Check Z2003, Z2004, R2006, R2025, R2026, C2025, C2026 . Change components if needed. Change components if needed.
Levels OK?
NO
YES
Replace phone
Does audio work during a call?
NO
YES
RAPGSM faulty?
Beyond economical repair
Problem solved

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Introduction to acoustics troubleshooting

Acoustics troubleshooting

Acoustics design ensures that the sound is detected correctly with a microphone and properly radiated to the outside of the device by speaker(s). The acoustics of the phone includes three basic systems: earpiece, Integrated Hands Free (IHF) and microphone.

The sound reproduced from the earpiece readiates through a single hole on the front cover (A-cover). The sound reproduced from the IHF speakers radiates from the sound holes on the bottom of the lower block. The hole of the microphone is located between the upper and the lower block, on the right side..

For a correct functionality of the phone, all sound holes must be always open. When the phone is used, care must be taken not to close any of those holes with a hand or fingers. The phone should be dry and clean, and no objects must be located in such a way that they close any of the holes.

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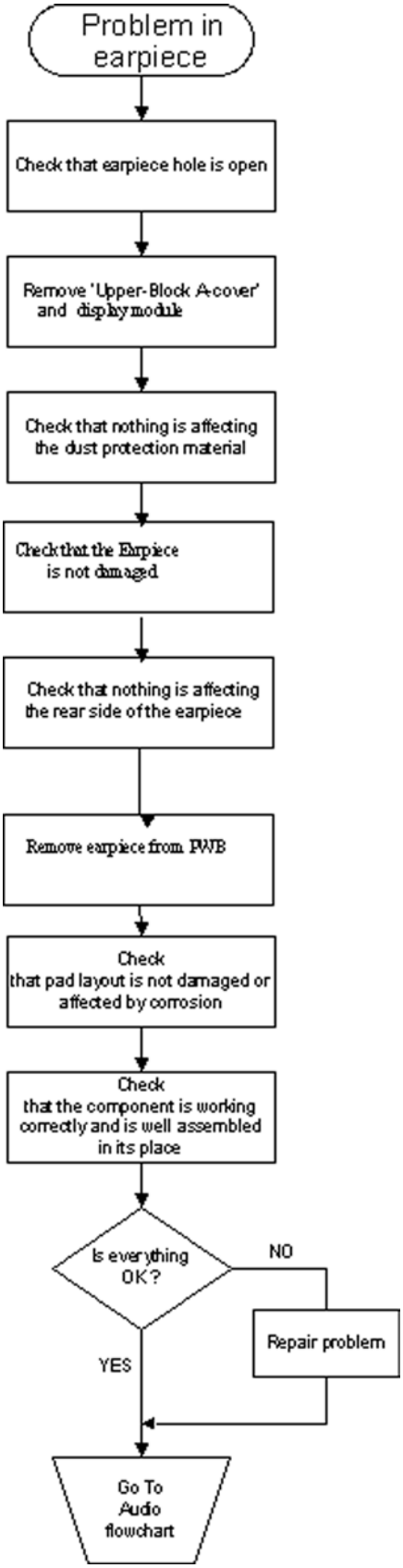
Earpiece troubleshooting

Troubleshooting flow


Problem in earpiece
Check that earpiece hole is open
Remove 'Upper-Block A-cover' and display module
Check that nothing is affecting the dust protection material
Check that the Earpiece is not damaged
Check that nothing is affecting the rear side of the earpiece
Remove earpiece from PWB
Check that pad layout is not damaged or affected by corrosion
Check that the component is working correctly and is well assembled in its place
Is everything OK?
NO
Repair problem
YES
Go To Audio flowchart

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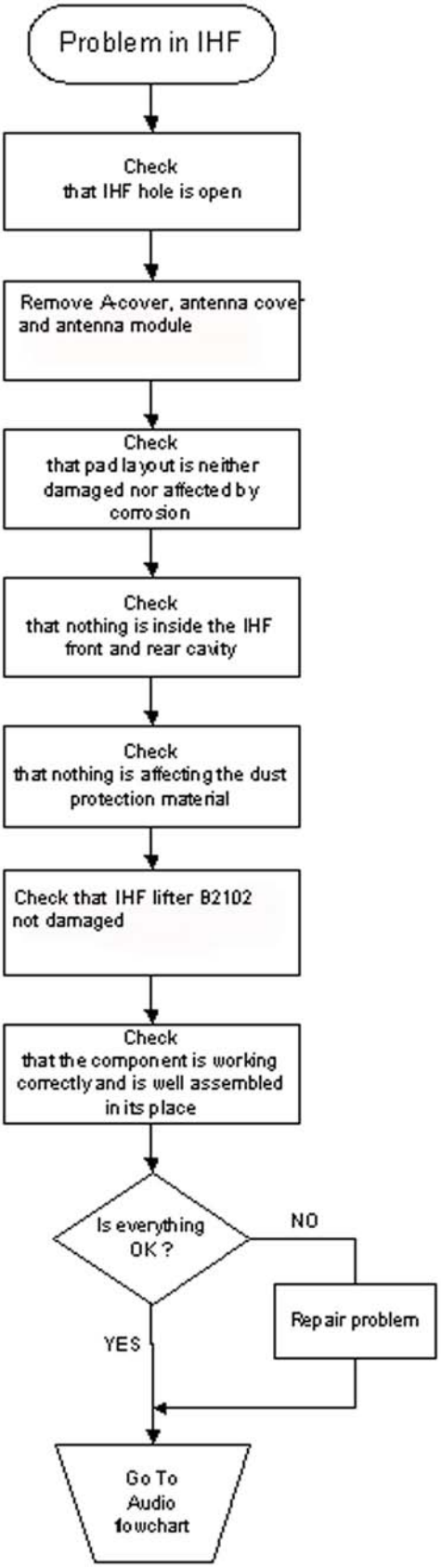
Acoustics IHF troubleshooting

Troubleshooting flow


Problem in IHF
Check that IHF hole is open
Remove A-cover, antenna cover and antenna module
Check that pad layout is neither damaged nor affected by corrosion
Check that nothing is inside the IHF front and rear cavity
Check that nothing is affecting the dust protection material
Check that IHF lifter B2102 not damaged
Check that the component is working correctly and is well assembled in its place
Is everything OK ?
NO
Repair problem
YES
Go To Audio flowchart

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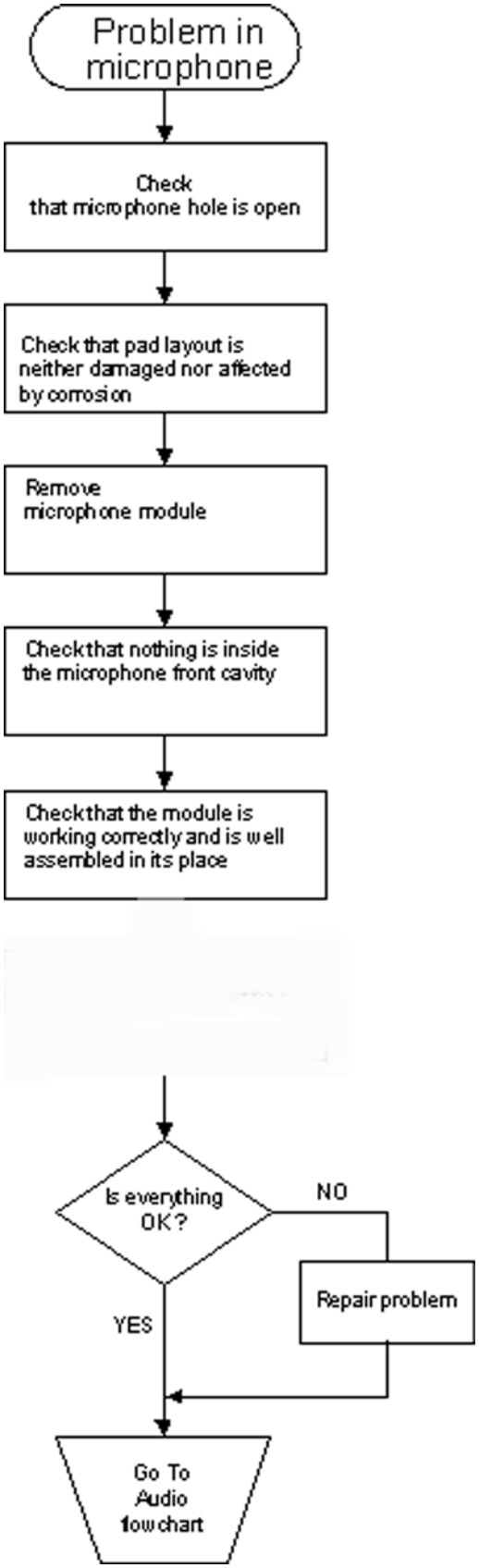
Microphone troubleshooting

Troubleshooting flow


Problem in microphone
Check that microphone hole is open
Check that pad layout is neither damaged nor affected by corrosion
Remove microphone module
Check that nothing is inside the microphone front cavity
Check that the module is working correctly and is well assembled in its place
Is everything OK?
NO
Repair problem
YES
Go To Audio flowchart

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Baseband manual tuning guide

Energy management calibration

Prerequisites

Energy Management (EM) calibration is performed to calibrate the setting (gain and offset) of AD converters in several channels (that is, **battery voltage**, **BSI**, **battery current**) to get an accurate AD conversion result.

Hardware setup:

- An external power supply is needed.
- Supply 12V DC from an external power supply to CU-4 to power up the phone.
- The phone must be connected to a CU-4 control unit with a product-specific flash adapter.

Steps

1. Place the phone to the docking station adapter (CU-4 is connected to the adapter).
2. Start *Phoenix* service software.
3. Choose **File→ Scan Product.**
4. Choose **Tuning→Energy Management Calibration.**
5. To show the current values in the phone memory, click **Read**, and check that communication between the phone and CU-4 works.
6. Check that the **CU-4 used** check box is checked.
7. Select the item(s) to be calibrated.

   Note: ADC calibration has to be performed before other item(s). However, if all calibrations are selected at the same time, there is no need to perform the ADC calibration first.
8. Click **Calibrate**.

   The calibration of the selected item(s) is carried out automatically.

   The candidates for the new calibration values are shown in the *Calculated values* column. If the new calibration values seem to be acceptable (please refer to the following "Calibration value limits" table), click **Write** to store the new calibration values to the phone permanent memory.

Table 11 Calibration value limits

Parameter	Min.	Max.
ADC Offset	-20	20
ADC Gain	12000	14000
BSI Gain	1100	1300
VBAT Offset	2400	2650
VBAT Gain	19000	23000
IBAT (ICal) Gain	5750	12250

9. Click **Read**, and confirm that the new calibration values are stored in the phone memory correctly. If the values are not stored to the phone memory, click **Write** and/or repeat the procedure again.
10. To end the procedure, close the *Energy Management Calibration* window.

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